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Pig Iron Stocks Less

Reductions Chiefly in Alabama and the Central West

Finished Material Specifications Fall Off—A March Record in Wire Output

Our March pig iron statistics show another sharp increase in production, due entirely, as in February, to the larger activity of steel works. Merchant furnaces last month fell slightly behind their February rate. The output of coke and anthracite iron last month was 2,188,161 gross tons, or 70,586 tons a day against 64,090 tons a day in February. There was a net gain of nine in furnaces active, all contributed, as in February, by the steel companies, the number of merchant furnaces in blast remaining the same. The steel works furnaces produced 48,970 tons a day last month, a gain of 6621 tons over the February rate, while the merchant furnaces produced 21,616 tons a day, a loss of 125 tons.

The daily capacity of the 231 furnaces in blast April 1 was 70,752 tons, against 66,562 tons a day for 222 furnaces on March 1. Production is now at the rate of 25,950,000 tons a year, including charcoal iron. This is a gain of 1,500,000 tons a year over the rate on March 1, and of 6,250,000 tons over the rate at the low point January 1.

Significant in connection with this large increase in production is the fact that since February 1 pig iron stocks at furnaces in the Ohio, western Pennsylvania and Wheeling districts have been reduced 57,000 tons, 45,000 tons of this being since March 1. More than 50,000 tons of the reduction was in merchant stocks, which from August, 1910, to February had shown a steady and heavy increase. Alabama stocks, including those at steel works, were reduced about 40,000 tons last month.

Most pig iron markets have been dull. An exception is Cincinnati, where new orders and shipments of foundry iron show improvement, though prices are not quite so firm. At Philadelphia a sale of 18,000 tons of mixed grades of Southern iron was made for the pipe trade, deliveries over six months.

In steel making iron the chief sale reported is 10,000 tons of Southern basic for Western shipment, deliveries through the remainder of the year. A Pittsburgh transaction in Bessemer iron is 10,000 tons for ingot molds, deliveries over five months, settlements to be at market prices established by not less than 1000-ton sales.

Finished material specifications show some falling off in most lines. Wire is an exception. The leading interest made a new record on wire shipments last month, and bookings continue good, particularly for fencing.

The Steel Corporation's new bookings in March were at the rate of 35,000 tons a day, against 40,775 tons a day in February. Shipments increased at the same time, as is well indicated by blast furnace opera-

tions. The Corporation's active furnace capacity is now 72 per cent., one Edgar Thomson and one Mingo having been blown out since April 1, while a fifth Gary furnace started up. Indications are that high point in production has been reached for the present.

The Harriman rail order is expected this week. Not more than 50,000 tons will be placed now, though the year's requirements have been put at 150,000 tons. The Sandy Valley & Elkhorn has bought 5350 tons, and the St. Paul 6000 tons, and an order has been taken for 3900 tons for Japan. The Grand Trunk inquiry for 18,000 tons is up, but the order is delayed by some questions over specifications. The Seaboard Air Line's order for 15,000 tons will probably go to the seaboard mill.

The Steel Corporation is low bidder on the latest Panama Canal letting, calling for 12,000 tons of steel for a large drawbridge and six lock gates. The Great Northern has placed 4000 tons of bridges. The chief structural contract is 11,000 tons for the Rothchild Building, Chicago, taken by the American Bridge Company.

Some improvement is noticed in the sheet trade, but tin plate operations are not quite as satisfactory as in recent weeks. The talked of advance of 10c. a box on fourth quarter business is not materializing.

Scrap markets are uniformly weaker, with no indications of any early improvement. Consumers are little tempted by the concessions thus far offered and stocks are heavy.

Lake Superior ore prices for 1911 are likely to be decided in the next fortnight. Late estimates of this year's movement are around 30,000,000 tons, or about 70 per cent. of that for 1910. The ore on Lake Erie docks April 1, about 7,745,000 tons, was more than in any year on that date.

Our Approaching Removal

The David Williams Company, publisher of *The Iron Age, Iron Age-Hardware, Metal Worker, Plumber and Steam Fitter* and *Building Age*, will remove its entire business from 14 Park place to 239 West Thirty-ninth street, between Seventh and Eighth avenues, New York City, and expects to be established in its new quarters in the week beginning April 10.

Several reasons have influenced the company when making this selection of a new habitation so far from the district in which it has so long conducted its operations. During the history of these various publications the office has been frequently removed, but it has always been within a short distance of the central post-office. Convenience to the post-office was the prime consideration. This motive no longer applies, arrangements with the New York post-office now being in effect whereby our publications are sent directly to the Pennsylvania and New York Central trains without passing through the post-office. For some time many of the business interests of New York have found it advisable to seek locations further north in the city. The trend has been steadily in the direction of the district extending from Twenty-third street to Forty-second street. In this locality are found most of the important hotels, great retail stores and leading places of amusement. The out-of-town visitor finds himself in that locality more frequently than in any other part of the city. The recent opening of the great Pennsylvania Railroad station at Thirty-third street and Seventh avenue has emphasized this movement.

The new location of our office is almost midway between the Pennsylvania Railroad and New York Central stations and is within walking distance from either. It will therefore be easy of access to out-of-town visitors traveling on lines using these terminals. It will also be within easy reach of the great new post-office which will occupy a portion of the Pennsylvania Railroad Company's ground on Eighth avenue. An important advantage which will be gained will consist in having the printing office under the same roof with the business and editorial offices. Much inconvenience has been suffered for a long time in the separation of the mechanical and editorial departments, the printing office being at some distance. The new quarters will also afford much more room for the present working force, as well as provide ample space for growth, which, we are pleased to say, seems assured.

Visitors will be welcomed in the new quarters, as they always have been in the old ones. Ample provision will be made for them, including writing facilities for those living out of the city and who sometimes may find it difficult to secure conveniences of this kind while temporarily in the city. The files of our various publications and our extensive collection of trade catalogues will also be at their service for reference.

Works Accident Insurance

It is significant of the widespread interest among employers in the question of workmen's compensation for accident that the National Metal Trades Association has set apart one of the sessions of the New York convention next week for the discussion of employers' liability insurance. It has been accepted as an inevitable result of the passing of accident compensation laws in various States that the rates of the employers' indemnity companies would be sharply advanced. This view is based, no doubt, largely on the experience of these companies in England under the régime of pro-labor legislation which has prevailed there in recent years. It overlooks two important facts, however. One is that the expense of litigation, which the indemnity companies have to bear under the present condition, will largely be saved under compensation legislation if it works out as its friends have predicted. The other is that under compensation legislation the mutual interest of employer and employee in the prevention of accidents should work a marked diminution in their number.

Two propositions which have been foremost in all the agitation of this question are: First, that a large percentage of works accidents is preventable and must be prevented; second, that where accidents do occur in spite of increased precautions the employee or his dependents should receive the largest possible percentage of the employer's outlay on account of the accident, to the elimination of lawyers' fees and costs of litigation. It would seem like a hopeless view of the effort to put this whole question on a better basis to say that the new situation is simply to be handed over to the indemnity companies to be dealt with by advancing the cost of insurance to the employer. No such outcome will satisfy employers who have gone into a study of the problem of works accidents with a serious purpose to make works employment safer and to deal justly with the victims of accidents. If it does not result in closer co-operation between employers and

employees to prevent accidents, the movement will have come far short of success.

In so far as they choose to insure with existing indemnity companies, we shall look to see those employers who spend money freely to reduce the liability to accident in their works to a minimum insisting on a preferential rate determined under an adequate system of inspection such as does not now exist in connection with accident insurance, except that against losses by fire or boiler explosions. Whether a gradation of rates can be devised which will satisfy the employers who have taken an advanced stand in safeguarding against accident is a question. It is certain that at present such employers bear an inequitable share of the losses paid by companies insuring against accident damages.

It would seem that one result of the régime which the new legislation is hastening will be to bring together in insurance associations many of the employing companies which may be regarded as choice risks. In the case of some of the best of the mutual fire insurance organizations among manufacturers the standard of preventive measures is so high that a certain discredit attaches to a fire involving any considerable loss. In a similar way there will ultimately come organizations of manufacturers in which co-operative study of the best methods of safeguarding workmen will result in the minimizing of accidents to a degree now considered out of the question.

Accident relief and compensation are praiseworthy, but the present agitation will come far short of the real end if it puts the chief emphasis on plans of insurance and schemes of compensation. Prevention and conservation must be the keynotes of the whole campaign.

The Geared Turbine and Its Lessons

C. A. Parsons, the inventor and developer of the steam turbine that bears his name, spoke very interestingly of the geared turbine in the course of a recent lecture delivered at the Royal Institution. The subject is of great importance, not only in turbine practice, but in other applications of power, such as fans, where it is economical and otherwise desirable to operate the motor at high speeds. The following is taken from an editorial on the lecture, published in London *Engineering:*

In this matter the pioneer was Dr. de Laval. The largest of his geared units was of but moderate output compared with the 900 horsepower of the Vespasian. At his lecture Mr. Parsons showed the pinion removed from the latter vessel after having served to drive the ship over 12,000 miles. The total wear did not exceed 2 mils, and apparently the gear would outlast the ship. As compared with the original machinery, the geared turbine has shown an economy of 22 per cent. The boilers and propeller are the same. The latter is run at 70 revolutions a minute, the turbine speed being 1400. The great saving in weight by the use of a high speed turbine is obvious. The efficiency of the gearing is so high that it is very difficult to measure the frictional loss, a transmission dynamometer of the usual type not being sufficiently sensitive to afford reliable results. A measurement of the rate at which heat generated in the gears leads, however, to the conclusions that the efficiency is over 98½ per cent.

One great advantage of the geared turbine at sea lies in the fact that racing is impossible. Many years ago single cylinder marine engines, fitted with a flywheel, were in use on the Holt Line, and it was found that the inertia of the flywheel greatly diminished the tendency for the engine to race in a seaway. With the geared turbine the flywheel effect of the high speed rotor is such that even if the propeller completely emerges the speed does not increase by more than 15 per cent. before the propeller returns again to its element.

Perhaps a still more noteworthy example of the effectiveness of modern gearing is afforded by the example Mr. Parsons quoted of an exhaust steam turbine of 750 horsepower, which he has supplied to drive a plate mill in Scotland. Here a double reduction gear is used, the turbine running at 2000 revolutions per minute and the mill at 70. There is also a 100-ton flywheel running at the same speed as the rolls. The energy stored in the rotating system is such that work can be given out for a short time at the rate of 4000 horsepower and the maximum deceleration at the end of each roll is only 7 per cent. It is now seven years since Mr. Parsons's experiments with geared turbines began, and he states that the results so far have been so uniformly satisfactory that he believes the system may be applied successfully to turbines generating many thousands horsepower. These deductions are quite in accord with the experiments carried out on this side of the water, not alone with turbines but with electric motors, where high speeds are desirable in order to reduce the size and initial cost of the installation.

Metal Frames for Aerial Craft

If the statistics could be collected, many would doubtless be surprised to learn of the extent of the profitable business that has been secured by certain gas engine builders resulting from the growth of the aeroplane industry, while the gradual standardizing of air machine parts is creating a wider demand for all kinds of material used in their construction. One branch of aeroplane manufacture that might prove a profitable field of endeavor is the making of metal frames for the machines. Many of the fatalities which have been reported through breakage of air crafts were the direct result of weak frames, which were principally constructed of bamboo or other light wood.

While metal tubing has to some extent been adapted to air craft construction, it is generally conceded by metal tubing experts that there is much room for profitable effort along these lines. Makers of light metal tubing have been amazed at the crudity of the construction of the framework of air machines, even of those used by the most expert aviators. As with the first bicycles, most of the heavier-than-air machines now in use bear unmistakable evidence of being "home made," and the repairs executed on some of them have borne the earmarks of work done by an amateur rather than by an expert machinist.

The average aviator is an adventurous mortal, who has graduated from the automobile racing class, with enough knowledge of machinery to "tinker up" a break, and invariably the patchwork of an indifferent mechanician satisfies his ideas of good workmanship. Most of the metal frames put into use so far have not displayed the niceties of construction known to practical metal tube makers, although an alloy of aluminum and steel has been found well adapted for this work. Just two days before his death through the breakage of his air machine at New Orleans last December, John B. Moisant announced that he would shortly introduce a monoplane of all metal construction, except that the propeller was to be of wood. It would appear that the proper standardizing of metal tubing for the bodies of air craft would do away with the necessity of much of the bungling repair work now

done on such machines, and if a standardized method of testing the tubing were developed there would be less need of repairs and naturally fewer accidents due to breakage of frames.

Correspondence

Ferromanganese in Chilled Cast Iron Wheels

To the Editor: Referring to the communication from A. E. Outerbridge, Jr., in your issue of March 16, and to your notice in *The Iron Age* of March 9, of the pamphlet issued by us respecting our manufacture of high grade charcoal iron for chilled car wheels, we beg to say that Mr. Outerbridge's statements seem to concern the results of tests made by him between 1880 and 1888, at which time the load carried by individual car wheels did not exceed four to five tons per wheel.

The problem now is to produce wheels that will meet service conditions under loads of nine to ten tons per wheel. A proper appreciation of the point at issue will be gained if the results of Mr. Outerbridge's experiments as stated by him are considered under two heads. First, concerning the strength of the unchilled body of wheel with respect to its ability to carry the increased load; second, concerning the character and quality of the chilled part of tread and flange with respect to its ability to withstand increased shock and strain and especially very severe heating by brake friction due to heavier loads carried.

In the extract from the paper read by Mr. Outerbridge before the Franklin Institute, in March, 1888, as quoted in your issue of March 16, the following statement concerning the effect of manganese is given:

> It undoubtedly produces a marked effect upon the character of the white crystalline structure. You may readily recognize "a manganese chill" by its coarse lamellar or foliated filaments and by the tendency which it produces to form white iron or "hard spots" in isolated places throughout the gray portion of a casting. Manganiferous pig iron has been used to produce chilled castings, but it does not make a durable wearing surface; the chilled tread of a car wheel, for example, produced by this method, presents to the eye, when broken through the section, a handsome appearance, but the white metal is comparatively soft; it may be easily bored, and, what is more serious, it crumbles readily under the impact of rapid shocks on the rail. A remarkable effect is produced upon the character of hard iron by adding to the molten metal, a moment before pouring it into the mold, a very small quantity of powdered ferromanganese, say 1 lb. of ferromanganese in 600 lb. of iron, and thoroughly diffusing it through the molten mass by stirring with an iron rod. The result of several hundred carefully conducted experiments which I have made enables me to say that the transverse strength of the metal is increased from 30 to 40 per cent., the shrinkage is decreased from 20 to 30 per cent., and the depth of chill is decreased about 25 per cent.

Mr. Outerbridge plainly states that the effect of manganese upon the chilled structure is to produce "coarse crystallization" and a chilled structure that will not give good service. Our pamphlet advocated the use of high grade charcoal pig iron for the manufacture of wheels that will stand the drop and thermal tests and at the same time possess a chilled structure in tread and flange better calculated to resist present service conditions under heavy freight equipment.

If our plea in this respect is what Mr. Outerbridge refers to as "special pleading which is altogether wrong," we are at a loss to follow his argument. We fail to see the advantage of practice that will make wheels stand the drop and thermal tests and yet fail to withstand the extreme service conditions imposed on tread and flange under present maximum loads. We realize the difficulty, not to say delicacy, of the situation as between the makers and users of chilled wheels and it is our desire to aid in the establishment of better conditions if possible. It appears to us to be a case where a proper knowledge and appreciation of the real facts is of the first importance and that if for any reason the present practice of wheel making should be changed to meet the present conditions of service, correct information on that point should be welcomed by all concerned.

At present prices paid for chilled wheels no one can question the impracticability of making wheels much different from present quality. The M. C. B. rules establish the price for new 33 in. wheels used for repairs regardless of weight at $9 each, and the credit to be given for one 33 in. scrap wheel removed at $4.75, leaving $4.25 for the company supplying the wheels, out of which all expenses, including making of inspections and tests, must be provided.

We are informed that the net result is that the chilled wheel makers receive less than ½ cent per lb. and an equal weight of scrap car wheels free as the maximum price paid for wheels even by the leading railroads, and in many cases the price is considerably less. It is manifest that about all that the wheel makers can do is to recast the old wheels into new ones and no doubt depend on the addition of ferromanganese to make wheels that will stand the drop and thermal tests.

Railroad officials have been investigating this matter for a number of years and particularly in the past four or five years. Whether their claim that the chilled wheel does not give satisfactory service under heavy equipment is warranted or not, it appears to be made more widely from year to year. The extensive trials of rolled steel wheels under heavy equipment also bear out the fact that railroads are seeking better wheels if they can be found. Certainly railroad officials cannot claim their unwillingness to pay better prices for better chilled wheels, considering the departure made in the case of steel wheels.

The time seems to have arrived for the manufacture and use of better chilled wheels, if the use of this type of wheels is to be continued under heavy equipment; and we as makers of charcoal chilling irons are trying to do our part in meeting the need of proper material for a demand which we believe will come, if indeed it has not already arrived.

Mr. Outerbridge's article will probably be quoted by those who approve present conditions in the manufacture and use of chilled wheels but it seems to us to contain in itself the fatal admission that under the practice he recommends the quality of chilled metal in tread and flange will be inferior, although the quality of the unchilled metal may be satisfactory. This is precisely the condition that exists to-day and for which the makers of chilled wheels must find the remedy if it can be found.

SUPERIOR CHARCOAL IRON COMPANY.
J. C. HOLT, Vice-President.
GRAND RAPIDS, MICH.

A Skeptic on Some Efficiency Figures

To the Editor: In the *American Magazine* for March, Ray Stannard Baker introduces to a section of the public "Frederick W. Taylor, Scientist in Business Management." Immediately following this article is a long paper by Mr. Taylor on "Scientific Management." Mr. Baker's account of Mr. Taylor is so eulogistic and so well supported by eminent authority that one turns to Mr. Taylor's article predisposed to accept what he says as the latest and most scientific statement on the very important subject of how to conduct great business enterprises in the most efficient and economic manner. Greatly to my surprise, however, I found the particular example cited by Mr. Taylor actually impossible of accomplishment, as I think what follows will demonstrate. In order to do full justice to Mr. Taylor, I quote what he says:

> One of the first pieces of work undertaken by us, when the writer started to introduce scientific management into the Bethlehem Steel Company, was to handle pig iron. The opening of the Spanish war found some 80,000 tons of pig iron piled in small piles in an open field adjoining the works. . . . . A railroad switch was run into the field right along the edge of the piles of pig iron. An inclined plank was placed against the side of a car and each man picked up from his pile a pig of iron weighing about 92 lb., walked up the inclined plank, and dropped it on the end of the car.
>
> This gang was loading on the average about 12½ long tons per man per day. We were surprised to find, after a scientific study of the men at work, that a first-class pig iron handler ought to handle between 47 and 48 long tons per day, instead of 12½ tons.
>
> A man named Schmidt was, after examination, selected to test the theory that with intervals of rest (time

not given) the handler of the pigs could do about four times more work than by the old method of continuous labor. Mr. Taylor describes what happened as follows:

Schmidt started in to work, and all day long, and at regular intervals, was told by the man who stood over him with a watch, "Now pick up a pig and walk. Now sit down and rest. Now walk. Now rest," &c. He worked when he was told to work and rested when he was told to rest, and at half-past five in the afternoon had his 47½ tons loaded on the car. And he practically never failed to work at this pace and to do the task that was set him during the three years that the writer was at Bethlehem.

To test the accuracy of these statements, it is only necessary to restate the problem in hours and minutes of work. Is it possible for one man to handle, in the manner stated, about 1050 pigs of iron (equaling 96,600 lbs.) per working day?

The length of the work day is not stated in Mr. Taylor's article, but, as he says the job was finished at half past five, it was probably 9½ hours. This, however, does not allow for the rest periods. Assuming that these were not less than 1½ hours for the whole day (and this is probably less than Mr. Taylor required), this would leave 8 full hours, or 480 minutes, of working time. To handle the necessary number of pigs of 92 lbs. each to make up the 47½ tons that were loaded daily would require the handler to carry up the plank and deposit on the car very nearly 2¼ pigs per minute. It would be physically impossible for any man to continuously work at this rate, even with Mr. Taylor's rest periods.

ROCHESTER, N. Y. ROBERT MATHEWS.

Explanation by Mr. Taylor

The following statement will appear in the book on "The Principles of Scientific Management," which will be published by Harper & Brothers, New York, April 20:

"Many people have questioned the accuracy of the statement that first-class workmen can load 47½ tons of pig iron from the ground on a car in a day. For those who are skeptical, therefore, the following data relating to this work are given:

"1. That our experiments indicated the existence of the following law: A first-class laborer, suited to such work as handling pig iron, could be under load only 42 per cent. of the day and must be free from load 58 per cent. of the day.

"2. That a man in loading pig iron, from piles placed on the ground in an open field on a car which stood on a track adjoining these piles, ought to handle (and that they did handle regularly) 47½ long tons (2240 lb. per ton) per day.

"That the price paid for loading this pig iron was 3 9-10 cents per ton, and that the men working at it averaged $1.85 per day, whereas in the past they had been paid only $1.15 per day.

"In addition to these facts the following are given:

47½ long tons = 106,400 lb. of pig iron per day.
At 92 lb. per pig, = 1156 pigs per day.
42 per cent. of a day under load = 600 min. × 0.42 = 252 min. under load.
252 min. ÷ 1150 pigs = 0.22 min. per pig under load.
A pig iron handler walks on the level at the rate of 1 ft. in 0.006 min.

"The average of distance of the piles of pig iron from the car was 36 ft. It is a fact, however, that many of the pig iron handlers ran with their pig as soon as they reached the inclined plank. Many of them also would run down the plank after loading the car. So that when the actual loading went on, many of them moved at a faster rate than is indicated by the above figures. Practically the men were made to take a rest, generally by sitting down, after loading 10 to 20 pigs. This rest was in addition to the time which it took them to walk back from the car to the pile. It is likely that many of those who are skeptical about the possibility of loading this amount of pig iron do not realize that while these men were walking back they were entirely free from load, and that therefore their muscles had, during that time, the opportunity for recuperation. It will be noted that, with an average distance of 36 ft. of the pig iron from the car, these men walked about 8 miles under load each day and 8 miles free from load."

Dr. R. W. Raymond Resigns

At a joint meeting of the Board of Directors and of the Council of the American Institute of Mining Engineers Dr. R. W. Raymond tendered his resignation as secretary. He has been relieved from the many executive and administrative duties, which have been increasing steadily, and which with the suggested extensions of the activity of the Institute must further multiply. Dr. Raymond has been appointed secretary emeritus of the Council, the Institute retaining his services for special editorial and other duties for which he is so well qualified by training and experience. Dr. Raymond, one of the founders of the Institute in 1871, was elected vice-president and became president in that year, following David Thomas, who resigned because his advanced age did not enable him to perform the duties of his office to his own satisfaction. He was annually re-elected a president in 1872, 1873 and 1874. In 1883 he was appointed secretary to succeed Dr. T. M. Drown, who had resigned. He was elected secretary in February, 1884, and has been annually re-elected since then.

Dr. Joseph Struthers, who has been connected with the Institute as assistant secretary for eight years, and as editor for five of these years, has been elected secretary of the Board of Directors and has been appointed secretary of the Council. Dr. Struthers was editor of the *Mineral Industry* for the years 1900-1903 (Vols. 8, 9, 10 and 11), and prior to that time was for 15 years on the teaching staff of the department of metallurgy of the School of Mines, Columbia University. He has been field assistant of the United States Geological Survey, in charge of the preparation of numerous reports for the *Mineral Resources*, and special agent of the United States Census in a like capacity. In connection with the work of the Institute, he is a member and treasurer of the Board of the United Engineering Society, chairman of its House Committee and secretary of the Library Conference Committee, which has general supervision of the libraries of the engineering societies in the United Engineering Society Building, 29 West Thirty-ninth street, New York City.

The Dille & McGuire Mfg. Company's Expansion.—This company, whose factory for the production of lawn mowers is at Richmond, Ind., has under construction a new plant which will occupy an entire city block. The new buildings are being erected on ground adjoining the old plant, which in the future will be used for warehouse and storage purposes. The building of the new plant will in no way interfere with the present one, which will be operated to the end of the season in order to complete the orders now in hand. Six new and separate buildings will be erected, connecting where necessary by metal runways or bridges, all being under cover. The new buildings will be numbered, as follows: No. 1, machine shop; No. 2, office; No. 3, paint and handle department; No. 4, oil and paint vault; No. 5, blacksmith shop and forming department; No. 6, grinding department.

The Pittsburgh Foundrymen's Association.—The monthly meeting of this society was held at Fort Pitt Hotel, on the evening of April 3. Professor Crabtree of the Carnegie Technical Schools of Pittsburgh delivered an address on "Experiments in Testings to Make a New Style of Iron Casting." The members of the association are busy making plans to entertain the American Foundrymen's Association on the occasion of its convention to be held in Pittsburgh, May 23 to 26.

The Steel Products Company, Columbus, Ohio, recently incorporated, has leased the plant of the Taylor Steel Company, Plain City, Ohio, which it is now operating. It will make a specialty of alloy steel castings. Among other products will be vanadium, titanium, manganese, chromium, nickel and carbon steel castings. F. L. Sessions is president, and A. V. Taylor is vice-president and secretary.

Pig Iron Production

Another Sharp Increase in March

Active Capacity April 1 About 1,500,000 Tons a Year More Than on March 1

As in February, the March output of the blast furnaces of the country reflects the enlarged operations of the steel works as the result of the buying movement that started in mid-January. The production of coke and anthracite iron last month was 2,188,161 gross tons, or 70,586 tons a day, against 64,090 tons a day in February. The net gain in blast furnaces active was 9 for the month, 14 having blown in and 5 having gone out. As in February, the gain was wholly due to the increased pig iron production of the steel companies. The number of merchant furnaces active remained the same, four blowing in and four blowing out. The steel works furnaces produced 1,518,063 tons last month, or 48,970 tons a day, a gain of 6621 tons a day over the February rate. The merchant furnaces produced 21,616 tons a day, against 21,741 tons a day in February, a loss of 125 tons.

The daily capacity of the 231 furnaces in blast April 1 was 70,752 tons, against 66,562 tons a day for 222 furnaces on March 1. Production is now at the rate of 25,950,000 tons a year, allowing for charcoal iron. This represents a gain of 1,500,000 tons a year in the past month, the rate on March 1 being 24,450,000 tons. Production is now at substantially the rate of the early summer of 1909 and of the same period in 1910.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, beginning with March, 1910, is as follows:

Daily Rate of Pig Iron Production by Months.—Gross Tons.

	Steel Works.	Merchant.	Total.
March, 1910	56,113	28,346	84,459
April	55,663	27,129	82,792
May	52,235	24,867	77,102
June	51,637	23,879	75,516
July	47,183	22,122	69,305
August	46,534	21,429	67,963
September	47,007	21,536	68,542
October	45,794	21,726	67,520
November	41,427	22,232	63,659
December	35,909	21,440	57,349
January, 1911	36,401	20,351	56,752
February	42,349	21,741	64,090
March	48,970	21,616	70,586

March Output by Districts

The table below gives the production of all coke and anthracite furnaces in March and the four months preceding:

Monthly Pig Iron Production.—Gross Tons.

	November. (30 days)	December. (31 days)	January. (31 days)	February. (28 days)	March. (31 days)
New York	142,610	142,674	136,519	131,238	157,624
New Jersey	18,284	15,437	12,627	6,006	5,869
Lehigh Valley	62,161	68,531	68,324	56,367	69,263
Schuylkill Val.	54,642	51,466	60,592	57,321	67,634
Lower Susquehanna and Lebanon Val.	50,370	51,888	43,942	42,729	46,980
Pittsburgh dis.	445,083	397,379	409,698	424,517	531,521
Shenango Val.	82,904	82,706	82,922	86,908	109,799
West. Penn	87,568	81,957	94,118	96,616	120,464
Md., Va. and Kentucky	58,772	59,945	56,424	57,759	61,628
Wheeling dis.	84,390	74,225	77,715	95,571	135,775
Mahoning Val.	180,717	162,349	174,318	201,624	203,006
Central and North. Ohio.	108,599	112,662	127,579	144,806	170,914
Hocking Valley, Hanging Rock and S.W.Ohio.	25,008	29,959	33,253	32,396	35,173
Mich.,Minn.,Mo., Wis.,Col.,Wash.	78,927	68,313	60,941	61,406	86,791
Chicago dis.	239,469	197,340	165,826	155,498	213,638
Alabama	165,512	154,025	128,188	118,594	143,751
Tenn., Georgia and Texas	24,764	26,961	26,340	25,153	28,331
Total	1,909,780	1,777,817	1,759,326	1,794,509	2,188,161

The list of furnaces blown in in March includes one Bethlehem (new) and one Crane in the Lehigh Valley, one Clairton in the Pittsburgh district, one New Castle in the Shenango Valley, two Cambria in western Pennsylvania, Princess in Virginia, one Ohio in the Mahoning Valley, one Joliet, one South Chicago and one Gary in the Chicago district, one Detroit in Michigan, and one Pioneer and one Ensley in Alabama. Furnaces blown out in the month preceding April 1 were one Lackawanna and Genesee in New York, McKeefrey in the Mahoning Valley, Ironton in the Hanging Rock district and one Rockwood in Tennessee.

Capacity in Blast April 1 and March 1

The following table shows the daily capacity of furnaces in blast April 1 and March 1. These figures are based largely on the performance of the furnaces in the past two months:

Coke and Anthracite Furnaces in Blast, and Capacity in Gross Tons.

Location of furnaces.	Total number of stacks.	April 1. Number in blast.	April 1. Capacity per day.	March 1. Number in blast.	March 1. Capacity per day.
New York:					
Buffalo	17	13	4,375	14	4,665
Other New York	7	2	314	3	529
New Jersey	7	1	190	1	156
Spiegel	2	..	....	..	....
Pennsylvania:					
Lehigh Valley	24	13	2,625	11	1,928
Spiegel	3	1	88	1	85
Schuylkill Valley	16	8	2,182	8	2,178
Low. Susquehanna	7	4	726	4	716
Lebanon Valley	10	5	789	5	810
Pittsburgh dis.	50	39	16,725	38	15,620
Spiegel	3	2	295	2	373
Shenango Valley	20	11	3,638	10	3,250
Western Penn.	27	13	4,095	11	3,375
Maryland	4	3	806	3	820
Wheeling district	14	12	4,380	12	4,350
Ohio:					
Mahoning Valley	23	17	6,590	17	6,425
Central and North.	22	14	5,484	14	5,232
Hocking Val., Hanging Rock and S. W. Ohio.	15	7	898	8	1,157
Illinois and Indiana	34	19	7,365	16	6,275
Michigan, Wisconsin and Minnesota	10	6	1,380	5	1,093
Colorado, Missouri and Washington	7	4	1,042	4	1,104
The South:					
Virginia	23	9	965	8	937
Kentucky	5	2	285	2	344
Alabama	46	19	4,710	17	4,235
Tenn. and Georgia	20	7	805	8	905
Totals	416	231	70,752	222	66,562

Production of Steel Companies

Returns from all plants of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel making iron is included in these figures, together with ferromanganese, spiegeleisen and ferrosilicon. These last, while stated separately, are also included in the columns of "total production":

Production of Steel Companies.—Gross Tons.

	Pig.—Total production.— 1909.	1910.	1911.	Spiegeleisen and ferromanganese. 1910.	1911.
January	1,117,823	1,773,201	1,128,448	19,538	8,360
February	1,073,363	1,620,539	1,185,782	21,396	12,821
March	1,140,553	1,739,212	1,518,063	25,591	11,784
April	1,093,092	1,669,898	.....	22,304	.....
May	1,256,448	1,619,283	.....	26,529	.....
June	1,365,527	1,549,112	.....	27,680	.....
July	1,508,762	1,462,689	.....	22,924	.....
August	1,591,991	1,442,572	.....	25,756	.....
September	1,660,839	1,410,221	.....	15,151	.....
October	1,769,094	1,419,624	.....	8,500	.....
November	1,689,994	1,242,804	.....	9,032	.....
December	1,768,799	1,113,174	.....	12,178	.....

Chart of Pig Iron Production and Prices

The fluctuations in pig iron production from January, 1907, to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron delivered at Chicago. They are based on the weekly market quotations of *The Iron Age*. The two sets of figures are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

	1907.	1908.	1909.	1910.	1911.
January	71,149	33,718	57,975	84,148	56,752
February	73,038	37,163	60,976	85,616	64,090
March	71,821	39,619	59,232	84,459	70,586
April	73,885	38,289	57,962	82,792	.....
May	74,048	37,603	60,753	77,102	.....
June	74,486	36,444	64,656	75,516	.....
July	72,763	39,287	67,793	69,305	.....
August	72,594	43,851	72,546	67,963	.....
September	72,783	47,300	79,507	68,476	.....
October	75,386	50,554	83,856	67,520	.....
November	60,937	52,595	84,917	63,659	.....
December	39,815	56,158	85,022	57,349	.....

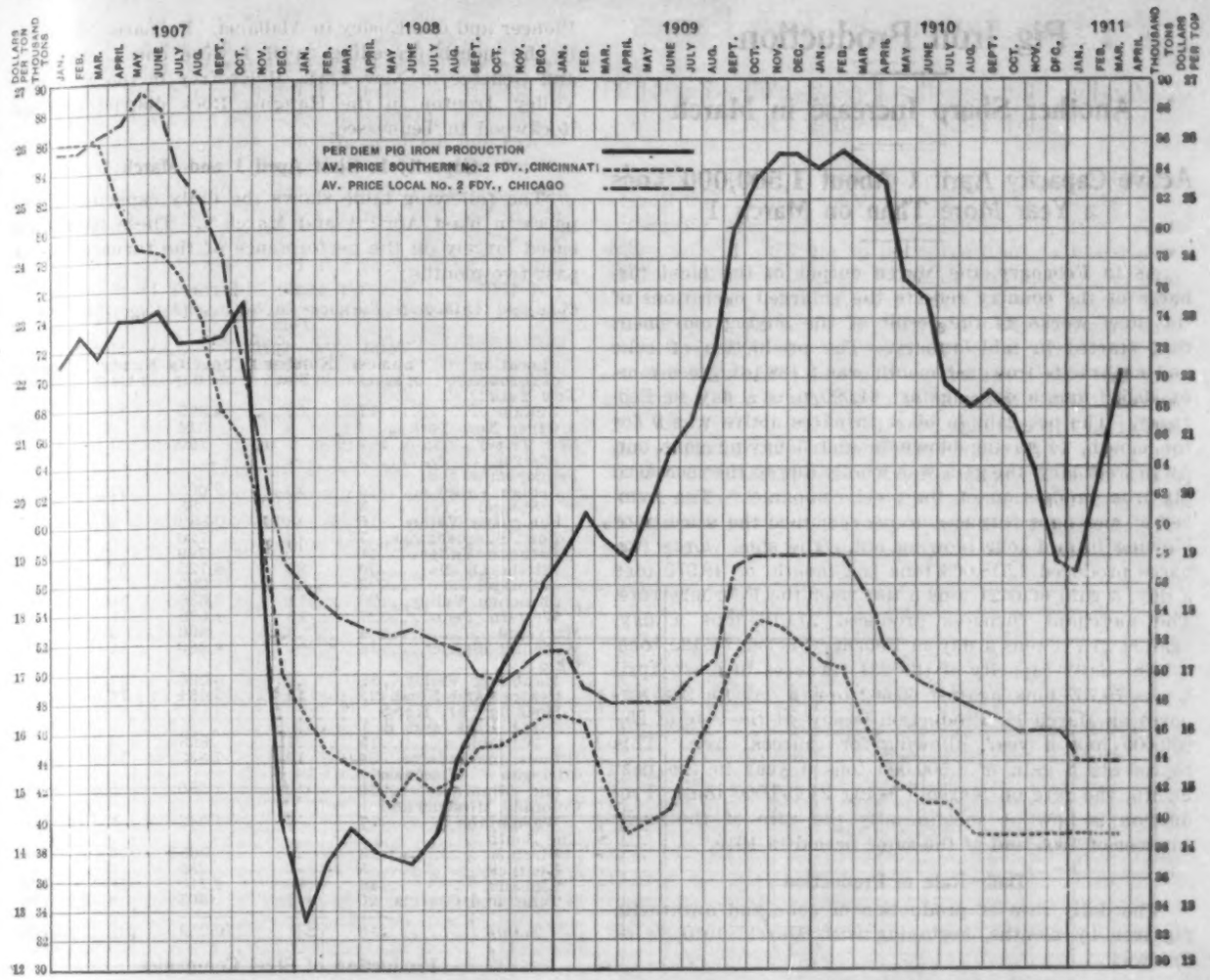

Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from January 1, 1907, to April 1, 1911; Also of Monthly Average Prices of Southern No 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron Delivered at Chicago.

Monthly Average Prices in Dollars of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry at Chicago Since January, 1907.

	1907.		1908.		1909.		1910.	
	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.
Jan.	26.00	25.85	16.15	18.45	16.25	17.35	17.25	19.00
Feb.	26.00	25.85	15.75	18.16	16.13	16.75	17.06	19.00
March	26.00	26.10	15.50	17.85	15.05	16.50	16.30	18.30
April	25.06	26.35	15.20	17.73	14.25	16.50	15.37	17.50
May	24.25	26.85	14.75	17.63	14.50	16.50	15.00	17.06
June	24.10	26.60	15.25	17.73	14.70	16.50	14.85	16.75
July	23.85	25.55	15.00	17.55	15.75	17.00	14.75	16.56
Aug.	23.00	24.85	15.25	17.35	16.38	17.13	14.31	16.50
Sept.	21.50	24.10	15.65	17.05	17.35	18.70	14.25	16.40
Oct.	20.95	22.45	15.75	16.85	17.88	19.00	14.25	16.06
Nov.	19.50	20.66	16.00	17.10	17.75	19.00	14.25	16.00
Dec.	17.00	18.80	16.25	17.35	17.45	19.00	14.25	16.00

Jan., 1911, 14-25, 15.50; Feb., 14.25, 15.50; Mch., 14.25, 15.50.

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

	1907.	1908.	1909.	1910.
January	2,205,607	1,045,250	1,797,560	2,608,605
February	2,045,068	1,077,740	1,707,340	2,397,254
March	2,226,457	1,228,204	1,832,194	2,617,949
April	2,216,558	1,149,602	1,738,877	2,483,763
May	2,295,505	1,165,688	1,883,330	2,390,180
June	2,234,575	1,092,131	1,930,866	2,265,478
July	2,255,660	1,218,129	2,103,431	2,148,442
August	2,250,410	1,359,831	2,248,930	2,106,847
September	2,183,487	1,418,998	2,385,206	2,056,275
October	2,336,972	1,567,198	2,599,541	2,093,121
November	1,828,125	1,577,854	2,547,508	1,909,780
December	1,234,270	1,740,912	2,635,680	1,777,817

January, 1911, 1,759,326; February, 1911, 1,794,500; March, 1911, 2,188,161.

The Buffalo Forge Company, Buffalo, N. Y., reports the receipt of a contract from the Hazel-Atlas Glass Company, Wheeling, W. Va., for the installation of one of its natural gas heating systems. This system consists of a motor driven fan with air distributing ducts and a natural gas heater with specially designed heating and mixing chamber in which the products of combustion are consumed. A moderate temperature is maintained in the heating chamber, with a resulting increase in durability. This system, which uses the gas fuel direct without an intermediary boiler, has proved very efficient. A number of installation have been made in the natural gas section of Pennsylvania and West Virginia, including some repeat orders.

Alaska Copper Coming.—The last spike completing the Copper River & Northwestern Railroad between Cordova on tidewater and Kennicott, Alaska, where the Bonanza copper mine is situated, was driven March 30. The first ore will be shipped from Kennicott for the Tacoma smelter this week. Work on the railroad, which is 197 miles long and cost $20,000,000, was begun November 15, 1907. Its construction is one of the most remarkable engineering feats of modern times. Beginning May 1, two cargo steamships will be operated between Tacoma and Cordova, bringing Bonanza ores to the smelter.

The Continental Radiator & Foundry Company, whose general office is at 1409-1411 Olive street, St. Louis, Mo., and present foundry at South St. Louis, is planning the erection of a new foundry at a location which has not yet been definitely decided. It is proposed to build a foundry for the manufacture of cast iron radiators with a capacity of 3,000,000 to 4,000,000 ft. per year. The building and equipment will cost about $175,000, and it is proposed to make it the most complete of the kind in the West. The president of this company is Hamilton A. Forman; vice-president and general manager, Lewis F. Ostrander; secretary and treasurer, John J. Ostrander.

The number of active blast furnaces in the Pittsburgh district shows a net increase of one between March 1 and April 1, the total April 1 being 41 out of 53. One Clairton furnace was blown in in March. Of the Edgar Thomson group nine furnaces are now in blast, the same number as on March 1. One furnace was blown in March, but another was blown out April 1.

Pig Iron Output in Two Panics

A Parallel Between the Period Following 1893 and That Following 1907

The accompanying reproduction of a chart prepared by Noah H. Swayne, 2nd, resident manager of Rogers, Brown & Co., Philadelphia, Pa., makes a most interesting comparison of the production of pig iron in the years 1893 to 1899 and 1907 to 1911—the last two panic periods. The curves represent the average daily production for each month in the respective years and are based on the monthly statistics of *The Iron Age*. It is interesting to note the parallelism of the different changes in the two periods. While the panic of 1893 began about five months earlier in the calendar year than that of 1907, the dips and peaks in the upper curve follow with a certain regularity those in the lower one about three months later. It is to be noted that in 1893 (lower curve) from a record rate of about 26,000 tons in May, it required five months to reach the low level of that initial decline, which was in October, with an approximate rate of 11,000 tons. In 1907, shown in the upper curve, the output in October was the high water mark, about 75,000 tons daily, but the decline was more precipitate, three months being sufficient to reach the low rate of that decline, approximately 34,000 tons in January, 1908. Recovery was gradual, both during 1894 and 1908, but the movement in both instances reached another peak within 12 months. November was the high point in 1894 at over 26,000 tons, while the peak in the later period was reached early in 1909, three calendar months later. Short periods of decline ensued in each case, after which there was again a steady upward climb until November, 1895, in the first instance, when a new high record of approximately 31,000 tons was made. From the upper curve it will be noted that the after-panic high point was again reached three months later than in the earlier depression, or in February, 1910, when we were operating at a rate of 86,000 tons a day. Declines followed, as is shown by both curves, the low ebb in the first being in October, 1896, with a rate of 16,500 tons. In the second curve, again three months later than in that for the nineties, the low point is observed in January, 1911, with a rate of about 56,500 tons. Should the parallelism continue with the same degree of regularity as indicated above, an upward movement would be seen in the next few months, to be followed by about six months of irregularity, but with a declining tendency and then succeeded by an upward movement to a new high record.

Another interesting feature of the chart is that the advances and declines, although represented by very different totals, have followed approximately the same percentage basis and thus give some support to the cycle view, which there has been so much of a disposition to ignore in connection with the recovery from the panic of 1907. In spite of the differences in the causes of the panics of 1893 and 1907 and in after-panic influences in the respective periods, there is much in the pig iron production curves suggesting that recovery from one panic has certain phases which may with reason be looked for in the recovery from another.

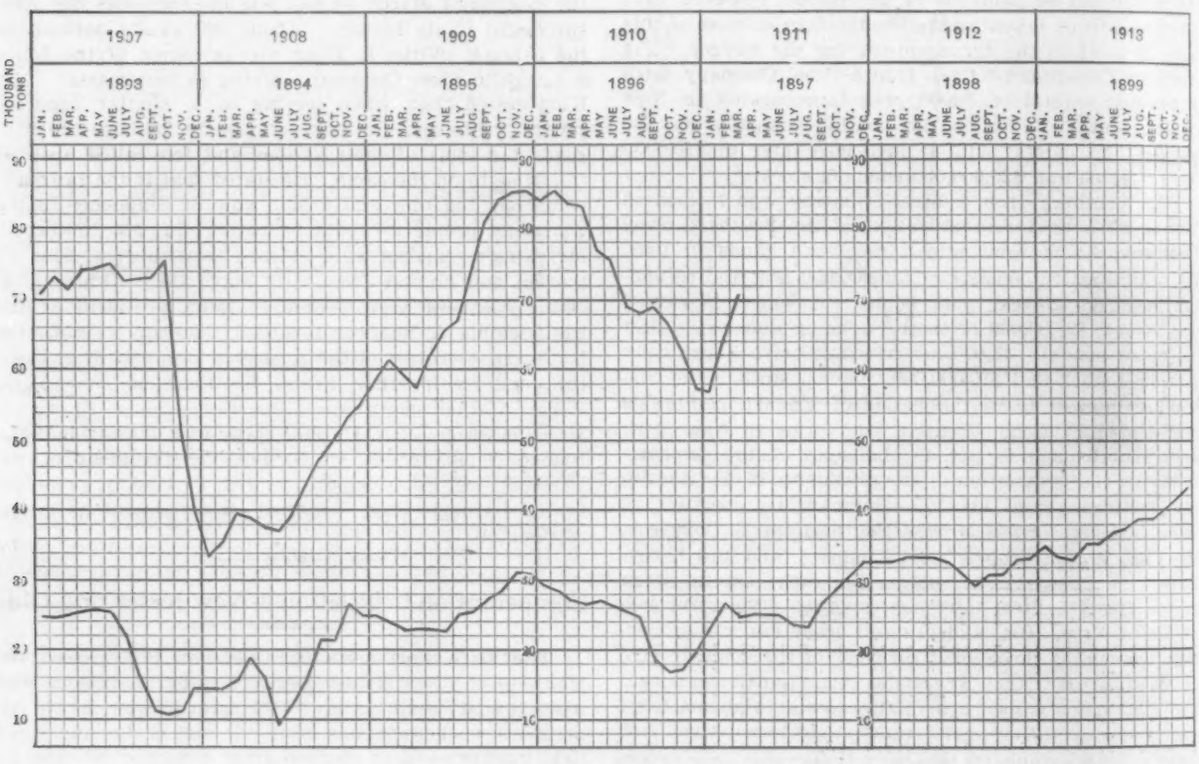

Chart Showing the Course of Pig Iron Production in the United States in the Years Following the Panic of 1893 (Lower Curve) and in the Years Following the Panic of 1907 (Upper Curve).

The Lakeside Forge & Wrench Company's property at Erie, Pa., will be offered for public sale April 18, at 2 o'clock p.m., on the premises, by M. L. Davis, receiver. The property to be sold comprises all the land and plant, including the personal belongings, bills and accounts receivable, &c. The land comprises about 2 acres, on which are erected a 50 x 180 ft. factory building, a 76 x 176 ft. factory building, a 76 x 76 ft. forge shop, together with boiler, oil and store houses. Among the equipment to be sold are two steam hammers, four drop hammers, four trimming presses and the usual machinery for finishing forgings.

The Newport Rolling Mill Company, Newport, Ky., is greatly pleased with the interest shown in its exhibit at the Railway Appliance Show, held in the Coliseum, Chicago, March 20 to 25. A full line of the sheets rolled by this company was displayed and, in addition, a comparative test was made between its genuine open hearth iron and other sheet metals. This test was conducted to demonstrate how genuine open hearth iron sheets will stand up under corrosive influences. The rust resisting qualities of the company's open hearth iron is causing it to be used for boiler tubes, corrugated culverts, tanks, stacks, stoves and ranges, cornices, skylights, eaves troughs, conductor pipe, &c., for which purposes it is said to give excellent results.

Corrigan, McKinney & Co. blew out their Genesee Furnace at Charlotte, N. Y., last month for relining.

Southern Companies May Merge

Southern Iron & Steel Company and Alabama Consolidated Coal & Iron Company

As has been well known, negotiations for the consolidation of two important Southern iron producing companies—the Southern Iron & Steel Company and the Alabama Consolidated Coal & Iron Company—have been in progress for some weeks. It is now stated that the controlling interests have decided that such a merger is advisable, and that bankers have given assurance that funds will be provided to carry present plans into effect and to provide working capital. What remains, in order to make the plans effective, is the consent of certain bondholders of the Southern Iron & Steel Company to accept in lieu of their bonds preferred stock in the consolidation. The company announced on April 1 that in view of the impending readjustment in its affairs the interest on its bonds due April 1 and amounting to $143,000 would not be paid. It is understood, however, that no steps will be taken by the bondholders in view of this default, pending the arrangements for the merger. The Alabama Consolidated Coal, Iron & Steel Company, with a nominal capital of $2000, was incorporated in New Jersey, March 10, to be the holding company for the merger. Its capital will be increased later to $10,000,000 preferred and $20,000,000 common stock.

The Southern Iron & Steel Company was formed in March, 1909, as a reorganization of the Southern Steel Company, which went into a receiver's hands in 1907. Its capitalization consists of $10,000,000 first and refunding mortgage 20-year gold bonds (of which $8,000,000 was issued, $2,000,000 of these replacing underlying first mortgage bonds); $7,000,000 noncumulative 6 per cent. preferred stock and $10,000,000 common stock. The controlling interest is in the hands of English capitalists represented by Cecil Grenfell, who came to New York some months ago to act as chairman of the company following the resignation of the president, W. H. Hassinger of Birmingham, Ala. The company's properties are those formerly owned by the Southern Steel Company, the Chattanooga Iron & Coal Company and the Lacey-Buek Iron Company, as well as the entire capital stock of the Georgia Steel Company, owning a blast furnace at Rising Fawn, Ga., and ore and other mineral properties. The other three blast furnaces of the company are at Alabama City, Ala.; Trussville, Ala., and Chattanooga, Tenn. It has six open hearth furnaces at Alabama City, and is now operating at the same plant the wire, rod and fencing mills completed in 1910. It has 918 coke ovens, three brown ore mines, five red ore mines and three limestone quarries. Its four blast furnaces have an annual capacity of about 250,000 tons. Its wire plant at Alabama City is credited with a capacity of 100,000 tons a year of wire rods, 130,000 tons of wire and 1,000,000 kegs of wire nails.

The Alabama Consolidated Coal & Iron Company was organized by Joseph H. Hoadley and others July 19, 1899. Its capital consists of $1,250,000 of preferred and $2,500,000 of common stock. It has four blast furnaces—two Clifton furnaces at Ironaton, Ala., with 100,000 tons capacity a year, and two Etowah furnaces at Gadsden, Ala., with 150,000 tons capacity a year. It owns red ore mines at Hammond, Ala., 5 miles east of Birmingham; also red ore properties near Attalla and Gadsden, Ala. It has coal properties in Tuscaloosa County, Ala., on which there are 915 coke ovens. At Lewisburg, Ala., near Birmingham, are two coal openings and 350 coke ovens. The company also has considerable acreage of brown ore and coal lands and 300 acres of limestone property between its Clifton and Etowah furnaces, on which it operates a quarry.

The Union Steel Casting Company's Extensions.—This company, whose plant is at Sixty-first and Butler streets, Pittsburgh, will erect a modern steel casting plant on the land it recently purchased, adjoining its present property. Bids are now being taken on several steel buildings. The main building aggregating 80,000 sq. ft., is to contain two 35-ton, two 25-ton, one 20-ton, six 10-ton and two 5-ton Morgan electric traveling cranes; two acid lined 25-ton furnaces to be built by William Swindell & Brothers, Pittsburgh; one charging machine, not selected, besides a full line of other equipment for the manufacture of steel castings for rolling mills, machinery, vanadium steel and steel locomotive frames, driving wheel centers, Union all steel truss roof, annealing boxes, &c. Patterns will be stored in a separate building, and there will be a power plant of 600 h.p. electrical equipment. Ground has been broken and the new addition is expected to be ready for operation in September. On April 18, the stockholders will vote on an increase in the capital stock from $1,500,000 to $2,500,000, part of which will be used to finance these improvements, the balance to be held in the treasury.

The Traffic Club of Pittsburgh

The ninth annual dinner of the above named organization was held in the Fort Pitt Hotel, Pittsburgh, on the evening of March 30 and was in every way the most successful in its history. About 600 guests partook of the banquet, Willis L. King, vice-president of the Jones & Laughlin Steel Company, serving as toastmaster. Mr. King stated that, when serving in a similar capacity several years ago, he took occasion to criticize the railroads for some of their actions and felt called upon at this time to do the same. He stated that if the railroads would get together and pass a vote of confidence in the American people it would be better for all concerned. Mr. King's remarks were listened to with very close attention and he was frequently applauded. Other interesting speakers were George F. Baer, president of the Philadelphia & Reading Railroad Company; James T. McCleary, secretary of the American Iron and Steel Institute, and Ex-Governor Frank S. Black of New York. Robert Mather, chairman of the Westinghouse Electric & Mfg. Company; J. A. Hatfield, president of the American Bridge Company; O. C. Gayley, vice-president of the Pressed Steel Car Company, and A. C. Dinkey, president of the Carnegie Steel Company, were present as guests of the club.

Compensation Legislation in New Jersey and Ohio

The Edge workmen's compensation bill passed the House of the New Jersey Legislature by unanimous vote April 3, and became a law. Its main provisions are explained elsewhere in this issue. It makes the employer's liability for accident compensation a matter of contract between employer and employee.

The special House committee of the Ohio General Assembly, which has been considering the Green-Thomas and Black bills for workmen's compensation, has adopted a compromise on the feature relating to payments by employers and employees into the State insurance fund. The Black bill, endorsed by manufacturers, provides that the employees pay 25 per cent., while the Thomas bill, representing organized labor, puts the entire assessment on employers. The compromise provides that the employers pay 90 per cent. and employees 10 per cent. Another compromise amendment permits waiving the right to compensation from the insurance fund in favor of a suit in court only where it is shown that the employer was grossly negligent.

The Foundrymen's Club of Cincinnati held its quarterly meeting at the Havlin Hotel the evening of March 30. Over 30 members enjoyed a banquet, with Paul A. Gosiger acting as toastmaster. Afterward the election of officers for the ensuing year occurred, and the following were chosen: President, William Goodman, Laidlaw-Dunn-Gordon Company; vice-president, A. W. Williamson, Peck, Williamson Company, and secretary and treasurer, A. G. Wessling, Wessling Bros. Foundry Company. George Elliott, Lunkenheimer Company, delivered a lecture on the "Composition and Structure of Iron Alloys," illustrating his talk with stereopticon views.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Apr. 5, 1911.	Mar. 29, 1911.	Mar. 1, 1911.	Apr. 6, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	$15.50	$15.50	$15.50	$18.00
Foundry No. 2, Valley furnace	13.75	13.75	13.75	15.75
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	15.75
Foundry No. 2, Birmingham, Ala.	11.00	11.00	11.00	12.50
Foundry No. 2, local, Chicago	15.50	15.50	15.50	18.00
Basic, delivered, eastern Pa.	15.25	15.25	15.00	17.75
Basic, Valley furnace	13.75	13.75	13.75	16.00
Bessemer, Pittsburgh	15.90	15.90	15.90	18.40
Gray forge, Pittsburgh	14.40	14.40	14.40	16.15
Lake Superior charcoal, Chicago	17.50	17.50	17.50	19.00
COKE, CONNELLSVILLE, Per Net Ton, at oven:				
Furnace coke, prompt shipment	1.60	1.60	1.45	1.95
Furnace coke, future delivery	1.75	1.75	1.60	2.15
Foundry coke, prompt shipment	2.00	2.00	2.10	2.50
Foundry coke, future delivery	2.25	2.25	2.25	2.75
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	23.00	23.00	23.00	27.00
Forging billets, Pittsburgh	28.00	28.00	28.00	32.00
Open hearth billets, Philadelphia	25.40	25.40	25.40	30.60
Wire rods, Pittsburgh	29.00	29.00	29.00	33.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	14.50	14.50	15.50	18.50
Iron rails, Philadelphia	*18.00*	18.50	18.50	20.50
Car wheels, Chicago	13.25	13.25	13.25	17.00
Car wheels, Philadelphia	*13.25*	14.00	14.00	16.75
Heavy steel scrap, Pittsburgh	*13.75*	14.00	14.75	17.00
Heavy steel scrap, Chicago	11.50	11.50	12.00	14.75
Heavy steel scrap, Philadelphia	*13.50*	13.75	14.50	16.50
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer steel rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.37½	1.37½	1.37½	1.55
Common iron bars, Chicago	*1.25*	1.27½	1.27½	1.55
Common iron bars, Pittsburgh	1.35	1.35	1.35	1.65
Steel bars, tidewater, New York	1.56	1.56	1.56	1.61
Steel bars, Pittsburgh	1.40	1.40	1.40	1.45
Tank plates, tidewater, New York	1.56	1.56	1.56	1.71
Tank plates, Pittsburgh	1.40	1.40	1.40	1.55
Beams, tidewater, New York	1.56	1.56	1.56	1.66
Beams, Pittsburgh	1.40	1.40	1.40	1.50
Angles, tidewater, New York	1.56	1.56	1.56	1.66
Angles, Pittsburgh	1.40	1.40	1.40	1.50
Skelp, grooved steel, Pittsburgh	1.30	1.30	1.30	1.50
Skelp, sheared steel, Pittsburgh	1.35	1.35	1.35	1.60
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.40
Wire nails, Pittsburgh*	1.80	1.80	1.75	1.85
Cut nails, Pittsburgh	1.70	1.70	1.60	1.85
Barb wire, galv., Pittsburgh*	2.10	2.10	2.05	2.15
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.50	12.50	12.75	13.75
Electrolytic copper, New York	12.25	12.25	12.37½	13.25
Spelter, New York	*5.55*	5.60	5.70	5.60
Spelter, St. Louis	*5.35*	5.45	5.55	5.45
Lead, New York	4.45	4.45	4.40	4.40
Lead, St. Louis	4.30	4.30	4.25	4.25
Tin, New York	41.75	41.25	42.25	32.90
Antimony, Hallett, New York	9.12½	9.12½	9.25	8.25
Tin plate, 100-lb. box, New York	$3.94	$3.94	$3.94	$3.84

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter, 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H.-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in., on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card effective September 1, 1909; tees, 3 in. and up, 1.45c., net; zees, 3 in. and up, 1.40c. to 1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.55c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 1.95c.; Nos. 17 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c.; No. 29, 2.35c.; No. 30, 2.45c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2.20c.; Nos. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18 to 22, 2.60c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, $1.55 per square. Galvanized sheets, No. 28, $2.75 per square for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
Butt Weld.				
1 to 1½ in	..	..	49	43
½ in	75	63	71	59
¾ to 1½ in	79	69	75	65
2 to 3 in	80	70	76	66
Lap Weld.				
2 in	76	66	72	62
2½ to 4 in	78	68	74	64
4½ to 6 in	77	67	73	63
7 to 12 in	75	59	71	55
13 to 15 in	51½	..	..	..
Butt Weld, extra strong, plain ends, card weight.				
⅛, ¼, ⅜ in	69	59	65	55
½ in	74	68	70	64
¾ to 1½ in	78	72	74	68
2 to 3 in	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in	75	69	71	65
2½ to 4 in	77	71	73	67
4½ to 6 in	76	70	72	66
7 to 8 in	69	59	65	55
9 to 12 in	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in	64	58	60	54
¾ to 1½ in	67	61	63	57
2 to 3 in	69	63	65	59

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Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	55	45
Plugged and Reamed.				
1 to 1⅛, 2 to 3 in. Butt Weld	Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe, Butt or Lap Weld as specified.			
2, 2½ to 4 in. Lap Weld				

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 5 in.	69	55

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $29 to $30 per gross ton. Fence wire, Nos. 0 to 9 per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed $1.60, galvanized $1.90; carload lots, to retailers, annealed $1.65, galvanized $1.95. Galvanized barb wire, to jobbers, $2.10; painted, $1.80. Wire nails, to jobbers, $1.80.

The following table gives the prices to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 Lb.

Nos.	0 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.75	1.80	1.85	1.90	2.00	2.10	2.20	2.30
Galvanized	2.05	2.10	2.15	2.20	2.30	2.40	2.80	2.90

Market and Stone Wire in Bundles, Discount from Standard List.

Bright and Annealed:	
9 and coarser	80
10 to 18	80 and 10
19 to 26	80 and 10 and 2½
27 to 36	80 and 5
Galvanized:	
9 and coarser	75 and 10
10 to 16	75 and 10
17 to 26	72½ and 10
27 to 36	72½
Coppered or Liquor Finished:	
9 and coarser	75 and 10
10 to 26	75 and 10
27 to 36	70 and 10 and 5
Tinned:	
6 to 18	75 and 10 and 10

Steel Rivets.—Structural rivets, ¾ in. and larger, 1.90c., base; cone head boiler rivets, ¾ in. and larger, 2c., base; ⅝ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, April 5, 1911.—(*By Telegraph.*)

Pig Iron.—Inquiries for pig iron in the past week have been very light. There does not seem to be any inquiry whatever for Bessemer iron. The agreement of the Valley furnaces, which also embraces several of the prominent dealers, to hold Bessemer iron at $15, minimum, at furnace, seems to be working out very well, as far as maintaining prices is concerned, but we do not hear of actual sales, except that mentioned in our report sent by mail. A fair amount of foundry iron is changing hands, most of it at $14, Valley furnace, but $13.75 can still be done with several producers for prompt shipment. One of the prominent ingot mold makers has recently sold 4500 tons of ingot molds for delivery in second and third quarters, but covered on the Bessemer iron needed for them some time ago and will not be in the market for any more iron at present. We quote Bessemer pig iron, $15; malleable Bessemer, $13.75; basic, $13.75 to $14; No. 2 foundry, $13.75 to $14, and gray forge, $13.50, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

Steel.—New inquiry for steel is only for small lots, but consumers are specifying at a fairly liberal rate against their contracts. Regular prices are reported as being firmly held. We quote Bessemer and open hearth billets, 4 x 4 in. and up to, but not including, 10 x 10 in., at $23, base, and sheet and tin bars in 30-ft. lengths, $24, f.o.b. Pittsburgh or Youngstown, full freight to destination added. We quote 1½-in. billets at $24, and forging billets at $28, base, usual extras for sizes and carbons, f.o.b. Pittsburgh or Youngstown districts, freight to destination added.

(*By Mail.*)

Generally speaking, March was a disappointment in the iron trade. New business has shown a falling off in the last two or three weeks. An exception to this is found in the fact that the rail and billet sales department of the Carnegie Steel Company passed orders in March for the mills for 350,000 tons, an increase over February of about 50,000 tons. There is more pessimism to be found in the trade to-day than a month ago. The pig iron market is quiet, the only important transaction during the week being a reported contract made by the Valley Mold & Foundry Company with the Shenango Furnace Company at Sharpsville, Pa., by which the former will take upward of 10,000 tons of Bessemer iron per month over the next five months. The contract is to go into force July 1. The iron will be delivered in a molten state in ladles, and taken direct to the foundry of the Thomas D. West Foundry Company, where it will be made into ingot molds. The contract is on a sliding scale basis, the average price Bessemer iron per month, as determined by actual sales of 1000 tons or more, to rule. The Shenango Furnace Company has been furnishing basic iron to the Valley Mold & Foundry Company on a similar arrangement for some years. The average price of Bessemer iron for March has been given out as $15, although there have hardly been enough sales to fix a price, and the average price of basic for the same month was $13.75, Valley furnace. There is a fair amount of new inquiry for furnace and foundry coke, with prices ruling a little stronger, but the scrap trade is about dead. Consumers overbought a month or six weeks ago, and are now said to be rejecting scrap which ordinarily they would take in without any complaint. The yards of most consumers are filled up to the limit and prices of scrap are weak.

Ferromanganese.—There is little new inquiry. This material is now said to have reached the lowest prices ever touched. It is said that foreign 80 per cent. has sold in some cases below $37, Baltimore. We quote $37 to $37.25, Baltimore, either for prompt shipment or for delivery over the remainder of this year. The freight rate from Baltimore to Pittsburgh is now $1.95 a ton.

Ferrosilicon.—No important inquiries are in the market. We quote 50 per cent. at $53, to $53.50, f.o.b. Pittsburgh, for delivery through the third quarter; 10 per cent. blast furnace silicon, $23; 11 per cent., $24, and 12 per cent., $25, f.o.b. cars, Jisco and Ashland furnaces.

Muck Bar.—The market is dull with prices weak. We quote nominally best grades of muck bar made from all pig iron at $29 to $29.50, delivered at buyer's mill in Pittsburgh district.

Skelp.—No sales of moment have been made. We quote grooved steel skelp at 1.30c.; sheared steel skelp, 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumers' mills in the Pittsburgh district, usual terms.

Wire Rods.—New inquiry is light and only for small lots. The supply at present seems heavier than the open market can absorb. We quote Bessemer, open hearth and chain rods at $29 to $30, Pittsburgh, but it is understood that very little business has been placed at the higher figure.

Steel Rails.—In the past week the Carnegie Steel Company received an order from a coal railroad for 5000 tons of standard sections and new orders and specifications for upward of 4000 tons of light rails. Its Edgar Thomson rail mills are now operating at about 50 per cent. of capacity, or slightly less, this having been the rate of operation of these mills for some months past. Prices on light rails are as follows: 12-lb. rails, 1.25c.; 16, 20 and 25 lb., 1.21c. to 1.25c.; 30 and 35 lb., 1.20c., and 40 and 45 lb., 1.16c. The prices are f.o.b. at mill, plus freight, and are the minimum of the market on carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c. per pound.

Plates.—The largest local car inquiry is still that of the Pittsburgh & Lake Erie, for 2000 steel cars. The Chicago, Burlington & Quincy is in the market for 1000 steel gondolas. The Pressed Steel Car Company has sold 120 ore cars of 60 tons capacity each to the Bingham & Garfield Railroad, Salt Lake City, Utah. The American Car & Foundry Company will build 1400 box cars, with steel underframes, for the Atlantic Coast Line, and 50 phosphate cars. The Seaboard Air Line has an inquiry out for 1000 box cars, with steel underframes, 200 phosphate cars, 30 cabooses and 9 passenger cars. The Pressed Steel Car Company has an order for 25 tanks, which will be shipped, knocked down to the National Railways of Mexico, and then built on cars after arrival at destination. The general demand for plates from boiler shops and other consumers is dull, and not more than 50 per cent. of plate mill capacity is active at present. We quote ¼ in. and heavier plates at 1.40c., Pittsburgh, and this price is said to be very well held.

Structural Material.—It now develops that the actual amount of material needed for the Quebec Bridge will be about 50,000 tons, made up of plates, shapes and steel bars, but there are very few eye bars. This material will be

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rolled by the Carnegie Steel Company, at Homestead, but the specifications will not come forward for some months. The structural trade is very quiet. Local fabricating interests report that the present period is the dullest for some months, only small orders, ranging from 100 up to 300 tons or less, having been received in the past week. Bids will be asked in a few days for the steel, probably 500 to 600 tons, for new buildings, for the United States Casting Company in this city. We quote beams and channels up to 15 in. at 1.40c., Pittsburgh.

Tin Plate.—Conditions in this trade are not quite as satisfactory as they have been. New orders for tin plate are light. New specifications against contracts are not as heavy, although those for June shipment are not due until April 15. Recently several of the tin plate mills are said to have entered some contracts for delivery through fourth quarter of the year on the basis of $3.70 per base box, while there was a verbal understanding some time ago that on business for fourth quarter all the mills were to ask 10c. advance, or $3.80. What effect this breaking over by two or three of the mills will have on the general situation remains to be seen. The leading interest is operating this week to about 78 per cent. of its hot tin mill capacity. We quote 100-lb. coke plates at $3.70 per base box, Pittsburgh.

Sheets.—New orders and specifications against contracts for sheets are showing some improvement, but March business was not up to expectations, by any means. There is also more disposition on the part of a few mills to grant slight concessions in prices to secure orders than existed in the trade about a month ago. This shading in prices is not general, by any means, but is closely confined to three or four points of delivery where competition for the business coming out is usually very keen. Regular prices on the different grades of sheets are given on a previous page.

Bars.—The new demand for steel bars is dull and specifications against contracts are not coming in as freely as they did a month or six weeks ago. As yet there have been no active negotiations with implement makers for their season requirements for the year beginning July 1. Prices on iron bars, which have been more or less demoralized for some time, are now reported to be a little firmer. We quote steel bars at 1.40c., and common iron bars at 1.35c. to 1.40c., Pittsburgh.

Shafting.—Fresh orders are only for small lots, while specifications against contracts are not active. When any attractive business comes up discounts are usually shaded. Regular discounts on cold rolled steel shafting are 57 per cent. off in carloads and 52 per cent. in less than carloads delivered in base territory.

Spelter.—New business is slack, while prices are weak. Prime grades of Western are quoted nominally at 5.30c., East St. Louis, equal to 5.42½c., Pittsburgh.

Hoops and Bands.—The demand is light. Specifications against contracts are coming in well from some sections, but not so freely from other points. Makers of hoops and bands are not operating to more than about 60 per cent. of capacity at present. We quote steel hoops at 1.45c. to 1.50c. and bands at 1.40c. extras on the latter as per the present steel bar card.

Merchant Steel.—New orders are only for such quantities as consumers actually require. Specifications against contracts in March, on the whole, showed a falling off as compared with February. We quote the higher grades of merchant steels, f.o.b. Pittsburgh, as follows: Iron finished tire, ½ x 1½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Rivets.—Like all other lines of finished material, the new demand is confined to small lots. Specifications against contracts are not satisfactory. Regular prices on structural rivets are 1.90c., and on boiler rivets 2c., but are shaded on desirable business.

Wire Products.—New orders and specifications against contracts continue heavy. This is, no doubt, the most active line in point of new business and shipment by the mills on the whole list of finished material. Leading mills are from two weeks to a month or more behind in shipments, especially on fencing wire, the demand for which is abnormally heavy. We quote galvanized barb wire at $2.10; painted, $1.80; annealed fence wire, $1.60; galvanized, $1.90; wire nails, $1.80, and cut nails, $1.70, f.o.b. Pittsburgh, full freight to destination added.

Spikes.—To avail themselves of the $1.55 price on spikes, which held good only until March 31, railroads rushed in specifications against their contracts at a larger rate in the latter part of March, one leading spike maker reporting that it received specifications for railroad spikes in the last two weeks in March at the rate of 1200 to 1500 kegs per day. No large inquiries are now in the market. Prices are now as follows:

Railroad Spikes.

4½, 5 and 5½ x 9/16	$1.60
3, 3½, 4, 4½ and 5 x ½	Extra .10
3½, 4 and 4½ x 7/16	Extra .20
3, 3½, 4 and 4½ x ⅝	Extra .30
2½ x ⅝	Extra .40
2½, 3 and 3½ x 9/16	Extra .60
2 x 9/16	Extra .80

Boat Spikes.

¾ in. square, 12 to 24 in. long	Extra .15
⅝ in. square, 8 to 16 in. long	Extra .15
½ in. square, 6 to 16 in. long	Extra .15
7/16 in. square, 6 to 12 in. long	Extra .20
⅜ in. square, 4 to 12 in. long	Extra .30
5/16 in. square, 4 to 8 in. long	Extra .45
¼ in. square, 4 to 8 in. long	Extra .75
¼ in. square, 3 to 3½ in. long	Extra 1.00

⅜ and 5/16 shorter than 4 in., ¼ cent extra.

Merchant Pipe.—The inquiry of the Guaranty Pipe Line Company, Los Angeles, Cal., for 50 to 60 miles of 8 and 10 in. steel pipe for a gas line has not yet been closed. No other large lines are actively in the market, but a good many projects that will take a large tonnage of pipe are talked of. The demand for merchant pipe was not as active in the latter part of March as it had been, and orders entered by the mills that month were about the same as in February. Discounts on iron and steel pipe given on a previous page are said to be quite well maintained.

Boiler Tubes.—There is nothing of interest to report. Large consumers are covered and are specifying against contracts in a fairly satisfactory way. Prices are said to be more or less open, one mill selling at whatever discounts it desires.

Coke.—Prices on both furnace and foundry coke are a little stronger, although new inquiry is rather light. A Mahoning Valley blast furnace interest is reported in the market for about 10,000 tons a month for the remainder of this year, deliveries to start about April 15. The output in the Upper and Lower Connellsville regions last week was 361,000 tons, a slight increase over the previous week. We quote standard makes of 72-hour foundry coke at about $2 for prompt shipment and $2.25 to $2.40 per net ton, at oven, for delivery over the remainder of the year. We quote standard makes of furnace coke for prompt shipment at $1.60 to $1.65, and for delivery over the next six months from $1.80 to $2 per net ton, at oven.

Iron and Steel Scrap.—The scrap market is about as dull as it could be, and it is evident that consumers overbought some time ago, rejections of scrap now being made that under other conditions would not take place. Dealers are not trying to force sales under these conditions. The Baltimore & Ohio scrap list came out on April 3 and is to close on April 15. It offers more material than usual. The greatest declines have taken place in prices of heavy steel scrap, bundled sheet scrap, borings and turnings, and we have reduced our quotations on these grades. Dealers are now quoting as follows, per gross ton, f.o.b. Pittsburgh, or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$13.75 to $14.00
No. 1 foundry cast	14.00 to 14.25
No. 2 foundry cast	13.25 to 13.50
Bundled sheet scrap, at point of shipment	9.50
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	14.50
No. 1 railroad malleable stock	13.00
Grate bars	11.00
Low phosphorus melting stock	17.00 to 17.25
Iron car axles	24.25 to 24.50
Steel car axles	20.00 to 20.25
Locomotive axles	24.00
No. 1 busheling scrap	12.50 to 12.75
No. 2 busheling scrap	9.00 to 9.25
Old car wheels	13.50 to 13.75
Sheet bar crop ends	15.50 to 15.75
*Cast iron borings	8.75 to 9.00
*Machine shop turnings	9.75 to 10.00
Old iron rails	16.00 to 16.25
No. 1 wrought scrap	14.25 to 14.50
Heavy steel axle turnings	10.25
Stove plate	11.00 to 11.25

* These prices are f.o.b. cars at consumers' mill in the Pittsburgh district.

Chicago

FISHER BUILDING, April 5, 1911.—(*By Telegraph.*)

Railroad buying has not yet assumed any great activity. Though there has been improvement in the tonnage of truck fastenings, an inclination to hold purchases down to actual needs of the day seems to prevail. The extreme quiet in the pig iron market has resulted in a weakening in prices of Southern iron, although no volume of new business has come forward as a result. Wire products are active and show good healthy country conditions. This wholesome situation is further demonstrated by cast iron pipe activity.

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caused by numerous small municipalities installing water works systems. Structural shapes are among the most active items in the market, though they are not up to normal, and fabricators generally could easily care for more work. In scrap hardly enough trading has been done to establish prices, though the general tendency is weakening.

Pig Iron.—The perfect calm that seems to have settled on the surface of the pig iron market has not been ruffled by sales or inquiries of note this week. The only apparently healthful inquiries that have been afloat have either sunk or drifted out of sight, and to-day not even ripples of activity are current. Recent price weakening rumors in Southern iron have become open, and $11, Birmingham, is now being quoted for both second and third quarters. Rumor is strong that this price has been named for the remainder of the year without obtaining results. Some furnaces are still adhering to their early determination to avoid sales at current prices for last half delivery, though the general consensus of opinion is that prices will be unchanged during the second and third quarters. The following quotations are for April, May and June shipment, Chicago delivery:

Lake Superior charcoal	$17.50 to $18.00
Northern coke foundry, No. 1	16.00 to 16.50
Northern coke foundry, No. 2	15.50 to 16.00
Northern coke foundry, No. 3	15.25 to 15.75
Northern Scotch, No. 1	16.50 to 17.00
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	15.50 to 16.00
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	17.90 to 18.40
Jackson Co. and Kentucky silvery, 8%	18.90 to 19.40
Jackson Co. and Kentucky silvery, 10%	19.90 to 20.40

(*By Mail.*)

Billets.—Billets in this district find an active market in practically no place outside the manufacture of car axles, and with business quiet in that field no sales of note have been made. The leading interest is maintaining its price of $30.60, base, Chicago, and the price on open hearth rerolling billets remains at $25.60, base, Chicago.

Rails and Track Supplies.—A very good volume of business has come in on track fastenings. Spikes and bolts have been particularly active for the past 10 days, and specifications on contracts have also been liberal. Light rails have sold freely, and about 10,000 tons of standard sections have been booked from various sources. Prices are firm, as follows: We quote standard railroad spikes at 1.70c. to 1.75c., base; track bolts with square nuts, 2.15c. to 2.25c., base, all in carload lots, Chicago. Standard section Bessemer rails, 1.28c.; open hearth, 1.34c. Light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12-lb., 1.25c. to 1.30½c., Chicago.

Structural Material.—New business on structural material has been somewhat active this week, the principal item being 11,000 tons, which will go into the Rothchild's Building in Chicago. This contract was let to the American Bridge Company. Half of the structure will be completed this year and the remainder in 1912. The Great Northern Railway is reported to have purchased 4000 tons of bridge work. The Toledo Furnace Company has bought 700 tons of material for its ore bins and testles. The Chicago, Burlington & Quincy Railroad is out with an inquiry for 600 tons of bridge material. Complaints are still heard that prices are not being firmly maintained by fabricators. We quote plain material from mill 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—Plate mills are running at but little better than half capacity and business is quiet. Building activities are a long way from normal in ship and car building yards. We quote mill prices, 1.58c. to 1.63c.; mill prices, 1.80c. to 1.90c., Chicago.

Sheets.—There is little change in the situation from that of a week ago. Mills are still running at about 60 per cent. capacity, with but a small volume of business in sight. We quote Chicago prices, carload lots, from mill: No. 28 black sheets, 2.38c.; No. 28 galvanized, 3.38c.; No. 10 blue annealed, 1.83c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.75c. to 2.85c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—The continued depression in the scrap market and the slack demand have put bar iron back in the rut from which it had such a hard time emerging a few weeks ago. There is only a fair demand for steel bars, and mills are running at less than 60 per cent. of their capacity with no great volume of business in sight. Prices are as follows: Soft steel bars, 1.58c.; bar iron, 1.25c. to 1.30c.; hard steel bars rolled from old rails, 1.35c. to 1.40c., all Chicago; from store, soft steel bars, 1.80c. to 1.90c.

Wire Products.—This corner of the market is unaffected by rumors of Supreme Court decisions or by the disinclination of railroads to buy. The small community and the American farmer are going straight ahead with the spring work, and the consumption of wire products continues to be enormous in the face of quietness in other branches of business. With the opening of navigation on the Great Lakes many Western buyers will begin their usual lake and rail shipments, and specifications are expected to be still more free from the great Northwest. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.78c.; wire nails, 1.98c.; painted barb wire, 1.98c.; galvanized, 2.28c.; polished staples, 1.98c.; galvanized, 2.28c., all Chicago.

Cast Iron Pipe.—Inquiries have been very free, although large specifications have not been numerous. The leading industry has closed with the city of Milwaukee, Wis., for 3200 tons of 6 to 16 in. water pipe. Kalamazoo, Mich., has purchased between 600 and 700 tons for spring work on the city water mains. The larger gas companies seem to be pretty well bought up, and the numerous orders for this material are coming forward from the smaller concerns in lots of from 100 to 400 tons. With the business already closed and numerous inquiries on their books, the leading pipe people seem justified in their opinion that this year's business will total above normal. Healthy country conditions and ease in money have helped many small municipalities in their decision to build water works this season. A bright outlook is naturally the result. Prices remain firm, per net ton, Chicago: Water pipe, 4-in., $25.50; 6 to 12 in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Material.—There have been practically no changes in the prices of scrap in this market, due largely to the fact that there has not been enough trading to establish a price. There have been no sales worthy of mention outside the selling of the Rock Island list which closed March 28. No. 1 springs on this list brought $10.70; No. 1 busheling sold at $9.93; locomotive tires for $17.40, and No. 3 cast at $9.35, all at seller's tracks. The Chicago, Milwaukee & St. Paul sold 500 tons of car wheels at $13. The Chicago, St. Paul, Minneapolis & Omaha is out with a list totaling 2500 tons, the principal item of which is 1500 tons of rerolling rails. The Great Northern has issued a new list amounting to 3000 tons of steel, malleable and cast scrap. There seems to be no bottom to the market, and buyers are not much in evidence. Prices are for delivery to buyers' works, all freight and transfer charges paid, and are as follows per gross ton:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	13.25 to 13.75
Old steel rails, less than 3 ft	12.75 to 13.25
Relaying rails, standard sections, subject to inspection	23.00 to 24.00
Old car wheels	13.25 to 13.75
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards, cut apart	11.75 to 12.25
Shoveling steel	11.00 to 11.50

The following quotations are per net ton:

Iron angles and splice bars	$12.50 to $13.00
Iron arch bars and transoms	14.00 to 14.50
Steel angle bars	11.00 to 11.50
Iron car axles	19.00 to 19.50
Steel car axles	18.00 to 18.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Steel knuckles and couplers	10.50 to 11.00
Locomotive tires, smooth	17.00 to 17.50
Steel axle turnings	8.00 to 8.50
Machine shop turnings	6.50 to 7.00
Cast and mixed borings	5.25 to 5.75
No. 1 busheling	9.50 to 10.00
No. 2 busheling	7.25 to 7.75
No. 1 boilers, cut to sheets and rings	8.25 to 8.75
Boiler punchings	12.50 to 13.00
No. 1 cast scrap	11.75 to 12.25
Stove plate and light cast scrap	9.75 to 10.25
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.00 to 10.50
Pipes and flues	8.50 to 9.00

Cleveland

CLEVELAND, OHIO, April 4, 1911.

Iron Ore.—It is very probable that definite action regarding ore prices for 1911 will be taken in the next two weeks. The leading ore firms have as yet given the matter no formal consideration, but there is a feeling among them now that the fixing of prices should not be delayed much longer. With the opening of navigation near at hand, shippers want to get some of their tonnage moving from their mines and down the lakes, and they feel that some buying activity can be stirred up by disposing of the price question. There is already some demand for small lots of certain ores for shipment as soon as boats begin to move. With prices fixed, however, the sale of only a limited tonnage is expected

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in the next few weeks. As yet there is an absolute uncertainty whether last season's prices will be maintained or whether a reduction will be decided upon. Some time ago it seemed almost a foregone conclusion that prices would be cut 50c. a ton. Strong opposition to lowering the price, however, has come from furnace interests having large stocks of ore on hand. Various estimates of the movement during 1911 are being made, but a fairly liberal prediction places it at 30,000,000 tons, as compared with 42,000,000 tons last year. Ore on docks April 1 is estimated at 7,745,000 tons. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—Sales the past week were limited to a few small lots. Some small new inquiries came out, none being for over 500 tons. Larger buyers continue to hold off. Several who have been feeling the market on prices for foundry iron for last half delivery in the past few weeks have deferred their purchases. Some sellers look for an improvement in the demand as soon as ore prices are fixed for the year. We note the sale of 500 tons of Southern iron for the last half to a northern Ohio consumer. Prices remain stationary. We quote No. 2 foundry at $13.75 to $14, Cleveland and Valley furnace, for the second quarter, and $14.25 to $14.50 for the last half. For prompt shipment and the second quarter we quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	14.50
Northern foundry, No. 2	14.25
Northern foundry, No. 3	14.00
Gray forge	13.50
Southern foundry, No. 2	15.35
Jackson Co. silvery, 8 per cent. silicon	18.00

Coke.—A local furnace interest has just contracted for its last half requirements, aggregating about 11,000 tons a month. The foundry coke market is very quiet. There is some demand for small lots for prompt shipment, but little inquiry for contracts for the last half. We quote standard Connellsville furnace coke at $1.60 to $1.65 per net ton, at oven, for prompt shipment, and $1.75 to $2 for the last half. Connellsville furnace coke is held at $2 for prompt shipment, and $2.25 to $2.50 for the second half.

Finished Iron and Steel.—Business continues fairly good in finished lines, but most selling agencies report a slight falling off in tonnage as compared with the previous few weeks. There is a good volume of orders, but they are for small tonnages, buyers specifying for only their early requirements. Some good steel bar specifications have come from rivet manufacturers. No new structural orders or inquiries for round tonnages have developed, but it is announced that specifications will be out in a few days for the Statler Hotel and the Y. M. C. A. Building in Cleveland. A few of the agricultural implement makers in this territory have been feeling the market on prices for new steel bar contracts, but it is expected that these interests will buy somewhat later than usual this season. The building outlook is very satisfactory in Cleveland, and a good demand is expected for concrete reinforcing bars, as well as small lots of structural material. Little business is coming from the railroads at present. Prices on steel bars, plates and structural material are firm at 1.40c., Pittsburgh. There is a fair demand for sheets and regular prices appear to be maintained. The demand for iron bars continues light. Prices are unchanged, 1.30c., at mill, being the minimum quotation.

Old Material.—The market continues quiet, but prices are steady and fairly firm. Dealers do not expect the present lull to be of long duration, and are generally declining to offer scrap at any concession from recent price quotations. Heavy steel scrap is usually held by dealers at $13.25, which is about 25c. a ton more than local mills seem willing to pay. The Pennsylvania Lines West closed April 4 on its usual list. Other railroad lists out are the Erie Railroad to close April 5 and the New York Central to close April 7. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	17.00 to 17.50
Steel car axles	19.50 to 20.00
Heavy melting steel	13.00 to 13.25
Old car wheels	13.00 to 13.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	8.00 to 8.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	6.50 to 7.00
Iron and steel turnings and drillings	7.25 to 7.75
Steel axle turnings	9.00 to 9.25
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.25
No. 1 cast	11.75 to 12.00
Stove plate	11.00 to 11.25
Bundled tin scrap	11.00 to 11.50

Philadelphia

PHILADELPHIA, PA., April 4, 1911.

Outside of a continued inquiry for structural material, the local market drags. The movement in pig iron has been less active. Practically no change in billets, sheets or bars is reported, although prices for iron bars are not quite so strong. Coke is quiet. Little demand for old material is reported, and prices show a further decline.

Iron Ore.—Negotiations are still pending for considerable quantities of Swedish ore, but close slowly. Importations at this port for the week ending April 1 include 20,235 tons of Swedish ore, valued at $92,816, and 16,400 tons of Cuban, valued at $45,100.

Pig Iron.—Transactions have been of an unimportant character, although negotiations are under way for a round block of low grade iron, and bids have gone in against an inquiry for 1200 to 2400 tons of charcoal iron and 2000 to 4000 tons of coke foundry iron for the Pennsylvania Railroad's requirements at Altoona in April, May and June. In foundry grades sales have been confined to small and moderate lots, for prompt and second quarter delivery, at prices ranging from $15.50 to $16 for the usual eastern Pennsylvania brands of No. 2 X foundry. Efforts are still being quietly made to effect purchases for third quarter, and even later delivery, but outside of taking care of some of their regular customers, sellers refuse to consider such inquiries, and will not openly name a price for shipment beyond the second quarter, although it is believed that business has been quietly done at the top range of present quotations. In Virginia foundry iron the movement being confined to odd lots for either prompt or near future delivery, for which producers name $13, furnace, for either No. 2 X or No. 2 plain grades. The leading interest is not holding out as strongly for an advance of 50c. a ton for second quarter delivery, and it is reported that $13, furnace, has been accepted by it for April shipment. One of the leading cast iron pipe iron makers in this district is still negotiating for a large block of low grade Southern iron, but orders have not yet been placed. There is still some demand for forge iron for rolling mill purposes, but no fresh sales are reported. Northern forge iron is steadily becoming less plentiful, and prices are being very firmly held at $14.75 to $15.25, delivered. In a few instances sales have been made at the top of the market. No inquiry for basic iron is reported and quotations are nominal. Low phosphorus iron has been sold in small lots at prices within the present range of the market, but there is little inquiry worth mentioning. No weakness in prices in this district is to be observed. Consumers are taking deliveries freely, and the statistical position in this territory promises, from preliminary reports, to be more favorable. Quotations are unchanged, the following range being named for deliveries in buyers' yards in this vicinity, during the second quarter:

Eastern Pennsylvania, No. 2 X foundry	$15.50 to $16.00
Eastern Pennsylvania, No. 2 plain	15.25 to 15.50
Virginia No. 2 X foundry	15.80 to 16.00
Virginia No. 2 plain	15.80 to 16.00
Gray forge	14.75 to 15.25
Basic	15.25 to 15.50
Standard low phosphorus	21.50 to 22.00

Ferromanganese.—There has been little fresh demand in this district, and sellers are quoting $37.25, Baltimore, for small lots for second quarter, and $37.50 for second half deliveries. This price would no doubt be materially shaded on any sizable business.

Billets.—Small orders make up the bulk of the business, and consumers show no indication of coming into the market for large lots for extended delivery. Aggregate business coming to the mills shows little variation and the rate of production is unchanged. Open hearth rolling billets are quoted at $25.40, with ordinary forging billets at $30.40, for early delivery in buyers' yards in this vicinity.

Plates.—Operations in the finishing departments at some of the Eastern mills show a decline from the recent high rate. This has been due more to the smaller size of orders than to any decrease in their number. The demand still covers very fully the general range of consumption. There is a very good volume of business in sight, particularly in plates for structural work. The prospect of an increasing demand for boat plates is also considered favorable. Quotations are being firmly maintained at 1.55c. minimum for ordinary plates, delivered in buyers' yards in this district.

Structural Material.—A very encouraging volume of inquiry is noted. Fabricators report an increased demand for material for buildings requiring from 50 to a few hundred tons, with an occasional larger specification. The structural work for Alexander Brothers' new building in this city, 350 tons, is up, and bids have gone in against 1000 tons for a new building for the Reading Iron Company, Reading, Pa. A very good demand for miscellaneous plain shapes for building

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purposes is also to be noted. Eastern shape mills continue to operate around 65 to 70 per cent. of capacity. While prices of plain shapes are being maintained at 1.55c., minimum, delivered in this district, fabricated material is still reported as beng very low and competition for business keen.

Sheets.—Mills continue to take sufficient day to day business to enable them to operate for the most part at full capacity, but there is still an absence of any demand for extended delivery, current orders being small and for prompt shipment. The following range of prices is named for early delivery by Eastern mills: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The demand for refined iron bars is less pronounced, and, while quotations are unchanged, there is an apparent tendency toward price shading on the part of some mills for business of a desirable character. A slightly better inquiry for steel bars is reported. For business of an ordinary character 1.37½c. to 1.45c. is named for refined iron bars, and 1.55c. for steel bars, delivered in this territory.

Coke.—Transactions have been confined closely to prompt lots, both in furnace and foundry grades. Consumers are holding back on contracts, as they can usually pick up spot lots at price concessions. Producers are not forcing business at present prices for forward delivery. Prompt foundry coke has sold at $2, at oven, while for forward delivery $2.20 to $2.40 is named. Moderate sales of spot furnace coke are reported at $1.60, at oven; for extended deliveries $1.70 to $1.90 represents the range of the market. For delivery in this territory the full range of quotations, per net ton, is about as follows:

Connellsville furnace coke	$3.75 to $4.05
Foundry coke	4.15 to 4.55
Mountain furnace coke	3.35 to 3.65
Foundry coke	3.75 to 4.15

Old Material.—The market is extremely dull and prices continue to move downward. Consumers are, for the most part, pretty well supplied and place orders only when bargains are available. Railroad lists are about of the usual character, and until they are cleaned up the buying in the general market is expected to be light. The top of the market for No. 1 heavy melting steel is about $13.75, delivered, and odd lots may be picked up at 25c. less, but sellers are not offering material at that level. Both borings and turnings show a decline on light trading. In fact, the whole list is weak. The following range of prices, while to some extent nominal, about represents the market for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 35c. to $1.35 per gross ton:

No. 1 heavy melting steel scrap	$13.50 to $13.75
Old steel rails, rerolling	14.50 to 15.00
Low phosphorus heavy melting steel scrap	17.75 to 18.25
Old steel axles	20.00 to 20.50
Old iron axles	... to ...*
Old iron rails	18.00 to 18.50*
Old car wheels	13.25 to 13.75
No. 1 railroad wrought	16.25 to 16.75
Wrought iron pipe	13.75 to 14.25
No. 1 forge fire	11.75 to 12.25
No. 2 light iron	7.50 to 8.00*
Wrought turnings	9.00 to 9.50
Cast borings	8.50 to 9.00
Machinery cast	14.00 to 14.50
Railroad malleable	12.00 to 12.50
Grate bars	12.00 to 12.50
Stove plate	10.50 to 11.00

* Nominal.

Birmingham

BIRMINGHAM, ALA., April 3, 1911.

Pig Iron.—Without doubt there has been some slowing down in the pig iron market, as far as sales in this immediate vicinity are concerned. When it was found that a price of $11, Birmingham, could be made effective, the purchasers felt apparently that there was no great reason to show undue anxiety about covering requirements ahead. The result has been a lessened demand, though shipments on old orders continue to move out at a most satisfactory rate. There does not, however, appear to be any disposition to make a concession below the established figure of $11, even for prompt shipment. And where reports to that effect are heard it generally means that the iron was bought by analysis or else was not fully up by analysis to the generally accepted standard for the grade. Some of the larger buyers still have inquiries before this market, but for the most part these are only "feelers," and it is believed that at any concession contracting might be made for large tonnages running through the year. The market for Southern charcoal iron shows decided strength; some good contracts have been entered. Prices for this iron remain very firm indeed. The month of March will have shown but little change in the producing rate over that of February. Those furnaces now operating have for some months had the best of picked material and all the stacks in blast seem to be, according to best reports, holding to steady records. Stocks are expected to show a still further decrease.

Cast Iron Pipe.—Several contracts for small filling in orders were booked by Alabama pipe producers the week past, mostly from the Central West. No reports are made of any lettings of consequence. Prices remain about as for the week previous. Production is still less than for the same period last year. It is felt that at present figures there is really no incentive to increase production, though this could be done to a fair degree on short notice should the demand justify. Prices quoted are as follows, per net ton, on board cars here: 4 to 6 in., $23; 8 to 12 in., $22; over 12-in., average $21, with $1 higher for gas pipe. These figures really represent quite an advance in the asking prices over those prevailing for December and are indicative of the very much stronger feeling that cast iron pipe should not be sold on a basis devoid of any profit.

Old Material.—There is considerable inquiry for certain grades of scrap, with the hope expressed that a better feeling will soon pervade the entire list. As a matter of fact, some buyers are quietly picking up all lots to be had on a bargain figure basis. Dealers report prices approximately as follows, per gross ton, on cars Birmingham:

Old iron axles	$14.00 to $14.50
Old iron rails	12.50 to 13.00
Old steel axles	12.50 to 13.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	8.00 to 8.50
No. 2 country wrought	7.50 to 8.00
No. 1 machinery	10.00 to 10.50
No. 1 steel	9.50 to 10.00
Tram car wheels	9.00 to 9.50
Standard car wheels	10.50 to 11.00
Light cast and stove plate	8.00 to 8.50

The Blast Furnace Committee of the United States Steel Corporation spent several days in this district last week, and very thoroughly investigated conditions pertaining to the iron and steel industry of the South, and particularly furnace practice here. Much interest was manifested in the raw material and its better preparation in this particular district.

L. E. Patton has been made resident manager of Hickman, Williams & Co. here, succeeding T. L. Powell, resigned to go in other business for himself in Chicago.

St. Louis

ST. LOUIS, April 3, 1911.

Building permits for March increased over the previous month, and the business of local fabricators is better. Jobbers of iron and heavy hardware are feeling the improvement usual in the spring. Pig iron is quiet, and there is not much demand for coke. Railroads are buying some track fastenings, but rails are quiet. The commercial demand for finished metals was good the past week.

Pig Iron.—The leading sales agencies are unanimous regarding the dullness of the market, both with respect to inquiries and sales. The consensus of opinion, with both commission houses and merchant sellers, is that, owing to the activity of the past three months, a let up in the demand, temporarily, is normal, and to be expected. There being no signs of an advance in prices buyers see no reason to anticipate their wants materially at this time, and it is likely some are waiting to close contracts for their finished products before adding to their purchases for future delivery. Buyers of finished products in turn are to some extent awaiting developments at Washington. Prices are unchanged. We quote No. 2 Southern foundry at $11, Birmingham, for shipment over the second and third quarter, and $11.50 for fourth quarter; No. 2 Northern foundry, $14, Ironton, Ohio, for shipment over the second quarter, and $14.50 for last half delivery.

Coke.—Beyond a jobbing demand, no transactions are reported. An inquiry for a large tonnage for shipment over the last half is mentioned. Specifications on contracts are coming in freely, and the situation is regarded as fairly satisfactory, in view of the quite large volume of business during the first quarter of the year. Prices are unchanged. We quote for selected Connellsville 72-hour foundry, for shipment over the remainder of the year, $2.25 per net ton, at oven; carload lots 25c. per ton higher.

Finished Iron and Steel.—The demand for structural material is improving. Specifications in steel bars are holding up well, and there is more inquiry from jobbers. There is a heavy demand for track fasteners. A new structure at Memphis, Tenn., will require 400 tons of steel bars.

Old Material.—The market is at a standstill. Business is only possible at prices that holders will not accept, and

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even trading among dealers is very light. Stocks are quite large and accumulating, but holders believe that an advance may come about in the near future. The Missouri Pacific is out with a list of 1500 tons of miscellaneous scrap, and the St. Louis & San Francisco with one of 900 tons. Prices are weaker and in some items lower. We quote dealers' prices, per gross ton, f.o.b. St. Louis:

Old iron rails	$13.50 to $14.00
Old steel rails, rerolling	12.75 to 13.25
Old steel rails, less than 3 ft.	11.75 to 12.25
Relaying rails, standard sections, subject to inspection	23.50 to 24.00
Old car wheels	12.00 to 12.50
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards, cut apart	11.00 to 11.50

The following quotations are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	18.00 to 18.50
Steel car axles	17.50 to 18.00
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Railway springs	10.00 to 10.50
Locomotive tires, smooth	16.00 to 16.50
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	4.50 to 5.00
No. 1 busheling	9.50 to 10.00
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	11.00 to 11.50
Stove plate and light cast scrap	8.50 to 9.00
Railroad malleable	9.00 to 9.50
Agricultural malleable	8.50 to 9.00
Pipes and flues	8.00 to 8.50
Railroad sheet and tank scrap	8.00 to 8.50
Railroad grate bars	8.50 to 9.00
Machine shop turnings	7.00 to 7.50

The Sligo Iron Store Company will build an addition to its warehouse at Sixth and O'Fallen streets, to accommodate its increasing business.

Cincinnati

CINCINNATI, OHIO, April 5, 1911.—(*By Telegraph.*)

Pig Iron.—Following its erratic course developed lately, the Southern market shows considerable improvement over the previous week, both in the matter of tonnage shipped and booked. It is estimated that the depletion in furnace stocks in the Birmingham district proper in March was over 40,000 tons, as compared with the amount on hand at the end of February, which is an indication that iron on contracts is moving freely. New contracts for No. 2 Southern foundry include one for 2100 tons at $11, furnace, shipments to run through the next four months. For prompt shipment and at the same price a nearby consumer bought 1000 tons of No. 2 soft, and for July to December delivery a Michigan manufacturer took 1200 tons of a well-known brand of Southern No. 2 foundry and at no advance in price. This same figure was inserted in a number of contracts for 100 to 300 tons, with deliveries ranging from April to September. For May shipment an eastern Pennsylvania firm purchased 1000 tons of Southern gray forge at $10, Birmingham. Northern iron continues quiet, but there has been no weakening in prices. Inquiries before the trade include one from northern Ohio for 1300 tons of either Northern or Southern No. 2 foundry for second quarter movement. Others from the same district call for 300 tons and 700 tons for prompt and last half shipment, respectively. There is no shading in prices in this market, and for prompt and second quarter shipment we quote No. 2 foundry at $11, Birmingham, and $14, Ironton, although several producers are extending deliveries through the third quarter, and there are a few Southern furnaces willing to take on contracts for the entire year at the present spot shipment quotation. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows, for first quarter:

Southern coke, No. 1 foundry	$14.75
Southern coke, No. 2 foundry	14.25
Southern coke, No. 3 foundry	13.75
Southern coke, No. 4 foundry	13.50
Southern coke, No. 1 soft	14.75
Southern coke, No. 2 soft	14.25
Southern gray forge	13.00
Ohio silvery, 8 per cent. silicon	17.70
Lake Superior coke, No. 1	15.70
Lake Superior coke, No. 2	15.20
Lake Superior coke, No. 3	14.70
Standard Southern car wheel	25.25
Lake Superior car wheel	19.50

(*By Mail.*)

Coke.—There does not appear to be any rush among foundry coke consumers to make any long-time contracts, though a few have signed up for a future supply. There is the usual amount of buying to fill immediate requirements. Furnace coke is also moving slowly, and while contracts are reported from other districts none has been closed here. Furnace coke for prompt shipment is quotable at $1.55 to $1.65 per net ton, at oven, in the Wise County, Pocahontas and Connellsville districts, and the uniform spot shipment price for foundry coke is $2, with the usual premium of 15c. to 25c. per ton asked for future shipment.

Finished Material.—Structural material is still in the lead, and the past week ended with a number of mill agencies showing a fair tonnage booked, and the inquiries this week coming in are encouraging. Steel bars are slow sellers, and hoops and bands are barely holding their own. On the other hand, railroad track material has recently been a good salable commodity. Mill prices are unchanged at 1.40c., Pittsburgh, and local warehouse quotations are around 1.85c. to 1.95c.

Old Material.—Prices have slumped on all grades of scrap. Consumers are stocked up, and one large local user has its side track full of cars loaded with scrap iron. Local buyers' yards are also stocked up, and there is no indication that the situation will improve very soon. Prices for delivery in buyers' yards southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$11.50 to $12.00
Cast borings, net ton	4.75 to 5.25
Steel turnings, net ton	5.75 to 6.25
No. 1 cast scrap, net ton	10.50 to 11.00
Burnt scrap, net ton	7.50 to 8.00
Old iron axles, net ton	16.50 to 17.00
Bundled sheet scrap, gross ton	8.00 to 9.00
Old iron rails, gross ton	14.00 to 15.00
Relaying rails, 50 lb. and up, gross ton	21.00 to 22.00
Old car wheels, gross ton	11.50 to 12.50
Heavy melting steel scrap, gross ton	10.50 to 11.00

San Francisco

SAN FRANCISCO, March 29, 1911.

In some departments a slightly stronger buying movement has been noted the last few weeks, but the improvement has been neither as great nor as general as conditions through the State would seem to warrant. Merchants are buying in a very conservative way, and the small jobbing trade, which is usually active in March, has just commenced to revive. A few large orders are coming out, however, and there are a number of rather indefinite inquiries in the market which may materially increase the April tonnage. Considerable business is expected within the next few weeks from the mountain mines, and the approach of the fruit season may also bring out more demand in some lines. Public service corporations and municipalities are among the principal buyers at present. Money is tight in San Francisco, and the disbursement of the exposition funds has not commenced, but the leading industries of the State appear to be in good condition.

Bars.—The market still appears to be somewhat unsettled, owing to competition between Eastern, foreign and Pacific Coast materials. Foreign bars can be placed in the harbor at about 1.65c.; and, while merchants are buying in only a limited way for future delivery, their stocks have been materially increased by recent arrivals. A considerable tonnage of bars from Irondale, Wash., has also been delivered within the last few weeks, and supplies held here are considerably in excess of current requirements. Orders booked by Eastern interests are mostly of a sorting-up nature. The demand for reinforcing bars is increasing all along the coast. The city of Los Angeles placed an order last week, and will receive bids on another lot March 31. New figures will be taken shortly on reinforced concrete barrack buildings for the navy yards at Bremerton, Wash., and Pearl Harbor, T. H. Locally, a lot of bars will be required for a concrete viaduct in Mission street. Plans are under way for a large amount of concrete bridge work in California. So far the jobbing price of soft steel has not advanced, but there is a rather firm feeling in the market. Bars from store, San Francisco, are quoted at 2c. for both iron and steel.

Structural Material.—The movement is fairly active, but more work of a notable nature having been let in Los Angeles and the northern cities than in San Francisco. There are several good inquiries in the market ehre, most of which have been mentioned before, but there is considerable delay in the actual letting of contracts. A good volume of small work, however, is coming out all the time, being for the most part taken by local fabricators. The outlook for San Francisco and vicinity is considered good. Bridge work has been a more important item than usual on the coast, and several large jobs of this nature are still in prospect. The inquiry for the Mt. St. Joseph's Orphanage is now in the market, and specifications for the Oakland City Hall will be out about the first of the month. Figures are being taken on the Security Bank Building, Oakland, about 450 tons. The Bankers' Investment Company is planning a large building on Market street, near Geary. Competitive plans are being solicited for the United States Subtreasury Building. The Los Angeles Investment Company has applied for a permit to erect a 14-story building, but the permit was refused. Plans are being prepared for the new Clunic Theater at Sacramento. Bids have been taken on a small bridge at San Luis

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Obispo, and there is an inquiry amounting to some 360 tons for two bridges in Ventura county. Bids on the American River bridge, at Auburn, Cal., will be opened April 4. Beams and channels, 3 to 15 in., from store, San Francisco, are quoted at 2.65c.

Rails.—The movement of standard sections this month has been satisfactory in comparison with the same period last year, though business has failed to materialize on a good many inquiries. More activity is expected in April. Numerous orders for light rails have been placed recently, and as some of the largest prospective consumers are still to be heard from, the outlook is decidedly favorable. Specifications have been completed for tubular steel trolley poles, spikes and track plates for the Geary street line, on which bids will be received next week. The town of Long Beach, Cal., is planning a double-track belt harbor road. It is reported that the Southern Pacific will shortly lay two additional tracks on its line between San Francisco and Redwood City. The Oakland, Antioch & Eastern Railway has been reorganized with increased capital, with the intention of adding a 50-mile extension to the 30-mile line now being laid. The extension, if built, will end at Stockton, Cal. The Oakland Traction Company has ordered 1000 tons of rails from the Pennsylvania Steel Company.

Sheets.—The jobbing trade in black and galvanized sheets is improving slowly. Several of the leading consuming industries are in good shape, but riveted pipe is rather quiet. Some large inquiries are coming up, and an active movement is expected.

Plates.—Prospective improvements to gas works will require a considerable tonnage of tank plates, but the market at present is quiet. The use of concrete for oil storage tanks is apparently increasing, and the demand for steel for the larger storage projects is accordingly curtailed.

Merchant Pipe.—Conditions in this department are highly unsatisfactory, without any apparent reason. While building is generally active throughout the State, the usual improvement in the distributive trade in March has failed to appear, and merchants are accordingly buying only on a very small scale. Bookings by representatives of the most important manufacturers have been even smaller than in February. There has been no important business in the oil fields, though inquiries from that quarter are increasing, and some good orders may develop within the next few weeks. The tonnage taken by water companies has been fairly large, but not sufficient to compensate for the dullness in other lines.

Cast Iron Pipe.—The demand continues active in all the coast states, and a few fairly large orders have been booked recently, though most of the business is in small lots. The Los Angeles Gas & Electric Company and the town of Porterville, Cal., have placed their orders with the United States Pipe Company. A number of large projects are under way, for which the pipe has not yet been provided. Considerable pipe will be required shortly at Portland and Albany, Ore., and a gas company at Eugene, Ore., is in the market for a lot of pipe. Bids will be taken shortly for several Government water plants, including those at Fort Ruger, at Honolulu; Fort McDowell, San Francisco; Fort Baker, in Marin county, Cal., and a 42-in. circulator pipe for the Mare Island Navy Yard.

Pig Iron.—There is no animation to the market for foundry iron, most of the local foundries working on a very limited scale, though some slight indications of improvement are noted. Prices show no quotable change, the figures on foreign iron depending largely on conditions of sale. Importers are asking $23 for English, Continental and Chinese foundry iron, and No. 2 Southern foundry iron is quoted at $21 to $22.

Old Material.—The demand for all descriptions of scrap has fallen below expectations, and the local market is very dull. Owing to an accumulation of steel scrap here, a shipment of 1000 tons is being sent to Philadelphia and 2500 tons has been sold for shipment to Genoa, Italy. Cast scrap is still scarce, but no large lots are wanted, and there is not enough demand to cause any advance. There is no movement of any consequence in either wrought scrap or old rails. Prices are quoted as follows: Cast iron scrap, per net ton, $18; steel melting scrap, per gross ton, $11 to $12; wrought scrap, per net ton, $12 to $15; rerolling rails, per net ton, $15.

The German Iron Market

BERLIN, March 23, 1911.

The position of the iron market has certainly not grown clearer in the past two weeks. It seems rather to have grown more involved and uncertain. To say that prices have weakened, yet that there is also talk of raising pig iron prices, is to give some measure of the contrary tendencies in the market. The last trading day on the Düsseldorf Exchange saw a drop of steel bar quotations, which are now 105 to 110 marks, as compared with 112 to 115 marks at the last previous quotation January 20. Hoops and bands also dropped to 135 to 140 marks, as against 140 to 145 marks. English No. 3 foundry was quoted at 68 to 70 marks, delivered at Ruhrort, as compared with 69 to 71 marks, and Luxemburg basic iron at 52 to 53 marks, against 52 to 54 marks. On the other hand, a proposal will be made at a meeting of the Pig Iron Syndicate to-morrow to raise the prices of pig iron, there being a strong favorable sentiment in the syndicate. The report given out by the Düsseldorf Exchange said that the calls for delivery of pig iron remain very brisk, and that an active business is also doing in other products at existing prices. Thus there are evidently contrary tendencies in the market. Similar news also comes from Belgium, where advancing prices had been announced for several weeks; but last week reductions of 6d. in the export price of bars, rivet stock, and ship angles, and 1s. in wire rods were reported from Antwerp.

The failure of the efforts to continue the bar convention has, upon the whole, not had so great an effect as had been looked for. Some of the smaller concerns, indeed, are selling at heavily cut prices but the great producers of the West are refusing to make any substantial reduction, for the home trade at least. The lower prices quoted above for the Düsseldorf Exchange are merely a reflection of the prices already existing in the open market. However, it is asserted that some of the smaller producers are taking orders for bars at as low as 100 marks, and in some cases even lower. Of course such prices are made only by mills short of work; but the great establishments of the Steel Works Union are mostly well supplied with bar orders and feel no necessity to join in the price cutting. The export business in bars even shows a certain firmness, but prices for export have long been at a very low level. It is now asserted that many of the big works took foreign orders at 92 to 94 marks some weeks ago, before the fate of the convention was settled; but it is added that they are insisting upon better prices now, and that some foreign selling is at even so high a price as 105 marks. The great mixed works have bar orders ahead for a month or two.

The mills of the Steel Works Union are reported as doing a somewhat better business. Work on semimanufactured material is abundant, and the mills are even exceeding their allotments; much of the product, however, is for export at comparatively unsatisfactory prices. A slight improvement in the demand for rails is mentioned, and some good foreign orders have again been taken. New orders for structural shapes have not come in during the past fortnight—since the opening of business at unchanged prices—as had been expected. As is usually the case in March, however, shipments of semifinished material, rails, and structural shapes are unusually heavy this month in anticipation of the close of the business year next week. In thin plates business is very quiet, and prices have been depressed to 137 to 138 marks; the mills are rather irregularly employed, and orders are slow in coming in. Conditions are also less satisfactory in heavy plates. Work on wire rods is at the normal rate, but export prices are very low. In drawn wire and wire nails many of the mills are short of work.

The excess of iron and steel exports over imports in February was 358,600 tons, comparing with 307,600 tons in February, 1910, and 354,000 tons in January, 1911.

Buffalo

BUFFALO, N. Y., April 4, 1911.

Pig Iron.—The market continues quiet, particularly as regards foundry and malleable irons, with a lessening volume of new inquiry, although some business has developed in charcoal iron and in specialties. The majority of sales made were for small lots for current consumption. One furnace interest, however, reports a number of orders totaling about 7000 tons for third quarter and second half delivery, from eastern New York and New England points, consisting chiefly of medium silicon foundry grades. Some life is shown in business with agricultural implement makers, but trade with car wheel foundries and those making railroad supplies is dull. Producers are finding it difficult to keep prices up to the higher level which they endeavored to establish a few weeks ago, and some furnaces have dropped off on quotations equivalent to an additional 25c. per ton from last week's schedule for current quarter delivery. The quotations given below represent prices for current quarter delivery, f.o.b. Buffalo, with an average of 50c. per ton higher asked for last half, most furnaces holding for prices for forward delivery that buyers consider prohibitive:

No. 1 X foundry	$14.25 to $14.75
No. 2 X foundry	14.00 to 14.50
No. 2 plain	13.75 to 14.00
No. 3 foundry	13.50 to 13.75
Gray forge	13.25 to 13.50
Malleable	14.00 to 14.50
Basic	14.25 to 15.00
Charcoal	16.75 to 17.50

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Finished Iron and Steel.—New business in shapes and bars shows slight improvement for the week, the demand for structural shapes being better than for some months. Specifications on contracts distributed over most classes of finished products are also coming forward in somewhat heavier volume. The Jones & Laughlin Steel Company has received an order, through general contractor C. A. Alexander, Rochester, for the concrete reinforcing bars required for the extensive additions to be made to the plant of the Johnston Harvester Company, Batavia, N. Y., about 500 tons. A number of small orders for rails for traction lines, aggregating about 2200 tons, have been taken by the Lackawanna Steel Company. Canadian export trade keeps up in good volume with an increasing demand from week to week. Figures are to be taken the coming week for the Main Street Realty Company's store and office building, 250 tons, and for the Buffalo General Electric Company's 17-story office building and the Hutchinson High School, Buffalo, requiring large steel tonnage. The Buffalo Structural Company has taken the contract for the steel for the A. L. Weber department store, 150 tons. The Lackawanna Bridge Company was low bidder for steel for the three buildings of the Atlas Steel Castings Company's plant, Buffalo, 200 tons, and also for the city fire station, Utica, N. Y., 175 tons. Wm. F. Felton, Buffalo, was low bidder for the intake pier superstructure for the new water works tunnel, Buffalo, 100 tons, and the Pittsburgh Bridge & Iron Company, Rochester, Pa., took the contract for the 600 tons of steel for the addition to the plant of the Hammermill Paper Company, Erie, Pa.

Old Material.—The market continues weak. Transactions have been very small and insufficient to test prices. There has also been only a moderate movement on contracts, most mills being well supplied for current needs. We quote as follows, per gross ton, f.o.b. Buffalo, prices being largely nominal:

Heavy melting steel	$13.00 to $13.25
Low phosphorus steel	17.25 to 17.50
No. 1 railroad wrought	15.50 to 15.75
No. 1 railroad and machinery cast scrap	14.50 to 14.75
Old steel axles	.... to ....
Old iron axles	.... to ....
Old car wheels	.... to ....
Railroad malleable	13.75 to 14.00
Boiler plate	11.50 to 11.75
Locomotive grate bars	11.75 to 12.25
Pipe	10.00 to 10.25
Wrought iron and soft steel turnings	7.25 to 7.75
Clean cast borings	6.75 to 7.00

New York

NEW YORK, April 5, 1911.

Pig Iron.—Some of the business pending last week has been closed. The American Locomotive Company's total purchases thus far for Eastern and Central Western plants amount to about 10,000 tons. Several foundry iron sales in this market were each for 1000 tons or upward, but average buyers seem inclined to do little for the latter part of the year unless attracted by the extension of present prices farther forward than furnaces generally will consider. Sellers are rather more active in seeking business; on the other hand, most of them are pretty well sold for the second quarter, and have been making full shipments on contracts. A sale of 1000 tons is reported to an electric interest, and some business has been done with foundries in the Hudson Valley. Prices are unchanged, and production in Eastern districts continues at about the same rate, one eastern Pennsylvania furnace has gone out of blast in the past week, while another was blown in. Rather sharper competition in the Buffalo district is indicated by recent transactions. We quote tidewater deliveries as follows: Northern No. 1 foundry, $15.75 to $16; No. 2 X, $15.50 to $15.75; No. 2 plain, $15.25 to $15.50; Southern No. 1 foundry, $15.50 to $16; No. 2, $15.25 to $15.50.

Steel Rails.—The Harriman order will probably be placed this week and will be for 50,000 tons or somewhat less. Whether later orders will bring the total for these lines up to the expected 150,000 tons remains to be seen. The Carnegie Steel Company has sold 5350 tons to the Sandy Valley & Elkhorn, a coal road, and 3900 tons for Japan will also be rolled at the Edgar Thomson mills. The Illinois Steel Company has booked 10,100 tons in the past week, including 6000 tons for the St. Paul and 2000 tons for an Indiana line. The Cambria Steel Company has booked an order for 1000 tons for a traction line. The Grand Trunk is inquiring for 18,000 tons, which will probably be placed in this country, though some question as to specifications is delaying the contract. The Seaboard Air Line is considering the purchase of 15,000 tons, which will probably go to the seaboard mill.

Ferroalloys.—There has been very little trading in this market in ferromanganese during the week, although inquiries for several lots that would total upward of 2000 tons are reported for the last half. The price is nominal, at $36.50 to $37, Baltimore. New York houses quote foreign ferrosilicon at $54, Pittsburgh, for stocks on hand, which is considerably below the cost of importation. The demand for the domestic product is light.

Finished Iron and Steel.—The Eastern demand for plates is very light, but enough business is being received from the West to keep the mills at between 70 and 75 per cent. capacity. Steel bars are quiet and still waiting for definite inquiries from the implement makers for their year's requirements from July 1. There is less activity in bar iron than a month ago, but a good volume of orders is still being placed. The last of the large structural contracts pending in New York City has been placed—the 7900 tons for the McAlpin Hotel, which has been awarded the American Bridge Company by the general contractor, the Thompson-Starrett Company. The revised plans for the Woolworth Building are yet to come out. The American Bridge Company also has 500 tons for the Avery Building at Columbia University. The Boston & Maine has awarded its bridge at Bellows Falls, 1200 tons, to the Boston Bridge Company. The Hinkle Iron Works has 400 tons for the Hotel Woodstock, West Forty-third street, New York; Eastern Steel Company, 350 tons for the New York Dock Company's pier 22 in Brooklyn; Lewison & Co., 900 tons for a loft on Union Square, at West Fifteenth street; Lewis F. Shoemaker & Co., 250 tons from Stone & Webster, Boston, for a power house at Jacksonville, Fla., and G. W. Neff Smith 300 tons for an addition to the Henry Siegel store in New York. Bids closed March 30 on 900 tons for two viaducts in the New York Central's suburban area, and also on 600 tons for a telephone exchange building in Portland, Me., on which the American Bridge Company is reported to be low bidder. April 15 bids will close on 1000 tons for a terminal building in Norfolk, Va., for the Norfolk & Western, the Virginian, and one or two other Southern roads. The Central Railroad of New Jersey is in the market for 1000 tons for car shops at Elizabethport. The lowest bid for the Panama Canal emergency lock gates, which will require 12,000 tons of plates, was submitted by the United States Steel Products Company, $2,238,987, and the McClintic-Marshall Construction Company was $40,000 higher. Prices are firm and without change: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.40c. to 1.45c., all New York. Store prices for plain material and plates, New York, are 1.85c. to 1.95c.

Old Material.—Conditions in this branch of trade are extremely unsatisfactory. Transactions have fallen to an exceedingly low point, and dealers are having increased difficulty with consumers in regard to rejections. It is more difficult than ever to make sales stick that were effected some time ago. One of the largest eastern Pennsylvania steel mills is embargoed, as material has been delivered to it too rapidly. No consumers of heavy steel melting scrap appear to be in the market, the only transactions effected in this line being with dealers having contracts to fill. Old car wheels are offered in considerable quantities without eliciting any bids, and no market can be found for re-rollers. Some transactions have occurred in relaying rails, but the demand in this line is spasmodic, and it is understood that a considerable quantity which had been lying in store here for some years was recently sold for scrap. The conditions have long been exceptionally favorable for the accumulation of scrap, so that supplies are heavy, while it is understood that the railroad lists to come out next week will again be large. About 250 tons of Panama scrap, at Hoboken, N. J., was sold on Tuesday, the bids ranging from $7.17 to $9.52 per gross ton, on lighter. The highest bid represents a decline of about $2 per ton since the sale of Panama scrap was made two weeks ago in Philadelphia. Dealers' quotations are as follows, per gross ton, New York and vicinity:

Old girder and T rails for melting	$10.50 to $11.00
Heavy melting steel scrap	10.50 to 11.00
Relaying rails	20.00 to 21.00
Standard hammered iron car axles	21.50 to 22.00
Old steel car axles	16.00 to 16.50
No. 1 railroad wrought	13.00 to 13.50
Wrought iron track scrap	12.50 to 13.00
No. 1 yard wrought, long	12.00 to 12.50
No. 1 yard wrought, short	11.00 to 11.50
Light iron	5.00 to 5.50
Cast borings	6.00 to 6.50
Wrought turnings	6.50 to 7.00
Wrought pipe	10.50 to 11.00
Old car wheels	11.50 to 12.00
No. 1 heavy cast, broken up	11.50 to 12.00
Stove plate	9.00 to 9.50
Locomotive grate bars	9.50 to 10.00
Malleable cast	10.50 to 11.00

Cast Iron Pipe.—The New York Department of Water Supply, Gas and Electricity opens bids to-day on 1025 tons of 6 to 12 in. pipe and 155 tons of special castings. New Bedford, Mass., will open bids April 17 on 1170 tons of 36-in. and 2200 tons of 30-in. pipe and 200 tons of specials. Fulton, N. Y., will open bids on the same day

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on 370 tons of pipe. Manchester, N. H., is in the market for 545 tons. The Quartermaster's Department of the United States Army, New York, it is announced, will readvertise for bids for 2000 tons. The Brooklyn Union Gas Company is in the market for 600 tons of 30-in. The demand from private companies has been moderately active. Competition continues keen for all orders coming up. Prices on carload lots of 6-in. range from $21 to $22 per net ton, tidewater.

Metal Market

NEW YORK, April 6, 1911.

THE WEEK'S PRICES

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead.		Spelter.	
March.	Lake.	Electrolytic.	Tin, New York.	New York.	St. Louis.	New York.	St. Louis.
30	12.50	12.25	41.35	4.45	4.30	5.60	5.45
31	12.50	12.25	41.37½	4.45	4.30	5.60	5.43
April.							
1	12.50	12.25	41.60	4.45	4.30	5.60	5.40
3	12.50	12.25	41.60	4.45	4.30	5.55	5.37½
4	12.50	12.25	42.12½	4.45	4.30	5.55	5.35
5	12.50	12.25	41.75	4.45	4.30	5.55	5.35

Tin is firmer and sold during the week at advancing prices. Copper is softer and continues rather weak. Lead is strong and in increased demand. Spelter is weak. Antimony is dull.

Copper.—The Copper Producers' report showing the March statistics will be out April 7, but that fact is not having much effect on the market, as it will not show large export sales, according to the copper sellers' own admission. Large consumers seem determined to hold out for lower prices, and are offering to buy large lots at 12.12½c. for electrolytic and 12.37½c. for lake, and there is an unconfirmed report that sales have been made at these figures. There are some offers of lake at 12.40c. and a few outside carload lots were sold on Thursday within a few points of that figure. The exports of copper so far this month were 1749 tons. In London to-day the market closed dull, with spot selling at £54 7s. 6d. and futures £54 18s. 9d. The sales amounted to 350 tons of spot and 700 tons of futures.

Pig Tin.—The special feature of the week was the remarkable showing of the statistics for the month of March. The statistics show the American consumption during the month to be 5100 tons, and the total for three months shows an increase of 1000 tons as compared with the same period last year. It is a remarkable fact that with this statistical showing, which is a record, the visible supply shows a decrease of 500 to 600 tons. The 2500 tons sold at the Banca auction March 29 went at a figure equal to 40.87½c., delivered in New York. In New York to-day pig tin was sold for 41.75c. The London market closed weak with spot tin selling at £191 and futures £187 10s. The sales amounted to 350 tons of spot and 450 tons of futures.

Tin Plates.—There is not much demand for tin plates in this market as the call from the general manufacturing field is very light. The mills are busy on orders in hand placed a few weeks ago, and the can manufacturers are the principal buyers just now. The price remains unchanged at $3.94 for 100-lb. coke plates. Foreign tin plates at Swansea, Wales, were quoted to-day at 14s. 6d.

Lead.—Lead was easier in St. Louis early in the week, but it continued strong in New York and good sales were made. While sales were reported in the West at a few points under 4.30c., they were outside lots offered by people who were anxious to convert their holdings into collateral. The New York market remained unchanged during the week at 4.45c., but was very strong. The leading interest continues to hold out for 4.50c., but is said to be meeting outside sellers in the Western market. To-day lead can be had in St. Louis for 4.30c. and in New York for 4.45c.

Spelter.—Spelter weakened in St. Louis last Wednesday and sales were made in that market at varying prices. Spot supplies are bringing relatively more in New York than in St. Louis, because of the scarcity of stocks here. For more than a year New York has ceased to be an important distributing point for spelter, the sellers preferring to hold their supplies at East St. Louis, and most of the sales made here of late were for prompt shipment from that point, consequently the spot market in New York is now 20 points higher than in East St. Louis, instead of 15 points, as formerly quoted. The St. Louis market is uncertain and 4.35c. is generally quoted there and 4.55c. New York.

Antimony.—Consumers are still uninterested, but some sales have been made by the dealers, many of whom are loaded with stocks purchased before the formation of the syndicate. The market in futures is weak, but the nominal prices for spot are unchanged with Cookson's selling at 9.50c. and Hallett's at 9.12½c.

Old Metals.—The market continues dull. Dealers' selling quotations are unchanged as follows:

	Cents.
Copper, heavy cut and crucible	11.75 to 12.00
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	10.50 to 10.75
Clean brass turnings	7.75 to 8.00
Composition turnings	8.75 to 9.00
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc scrap	4.25 to 4.30

Metals, Chicago, April 4.—A number of good sized orders were placed in this market last week for lake copper at the prevailing price of 12¾c. These orders had been expected for some time, and now that they have been purchased it is believed there will be a decline in the price. There was also a good amount of business done in other metals in small lots. We quote Chicago prices as follows: Casting copper, 12½c.; lake, 12¾c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 42¼c; small lots, 44¼c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.70c. to 4.75c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.40c. to 5.45c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12¼c.; copper bottoms, 10¼c.; copper clips, 12c.; red brass, 10½c.; yellow brass, 9c.; lead pipe, 4⅜c.; zinc, 4¼c.; pewter, No. 1, 29c.; tin foil, 32c.; block tin pipe, 35c.

Metals, St. Louis, April 3.—Lead is higher, quoted at 4.30c. to 4.32½c.; spelter is lower and quoted at 5.32½c., both at East St. Louis. Zinc ore is unchanged at $37 to $40 per ton, Joplin base. Tin is quoted at 42.10c.; antimony (Cookson's), 9.85c.; lake copper, 12.85c.; electrolytic, 12.60c., all at St. Louis. The demand for finished metals the past week shows considerable improvement.

Iron and Industrial Stocks

NEW YORK, April 5, 1911.

Another week of comparative stagnation has been experienced in the stock market. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., pref.	31	Railway Spr., com.	34
Beth. Steel, com.	32 - 32½	Railway Spr., pref.	99 - 100
Beth. Steel, pref.	61½ - 62½	Republic, com.	32½ - 33⅛
Can, com.	9¼ - 9⅝	Republic, pref.	97⅝ - 97⅞
Can, pref.	80 - 81	Sloss, com.	52½ - 53
Car & Fdry, com.	53½ - 54½	Pipe, com.	16¼
Car & Fdry, pref.	115	Pipe, pref.	56 - 58¾
Steel Foundries	46⅜ - 47½	U. S. Steel, com.	77½ - 79½
Colorado Fuel	31¼ - 31½	U. S. Steel, pref.	118⅝-119⅝
General Electric	148 - 149¼	Westinghouse Elec.	66½ - 67
Gr. N. ore cert.	60¼ - 63¼	Am. Ship, com.	71⅝ - 72¾
Int. Harv., com.	116⅝-119	Am. Ship, pref.	111*
Int. Harv., pref.	124¼	Chi. Pneu. Tool	51⅝ - 52¾
Int. Pump, com.	40⅝ - 41	Cambria Steel	47⅝ - 47⅞
Int. Pump, pref.	88½	Lake Sup. Corp.	27⅞ - 29½
Locomotive, com.	37½ - 38¾	Pa. Steel, pref.	107½-108
Locomotive, pref.	107½-108	Warwick	11
Pressed St., com.	33 - 33⅛	Crucible St., com.	12¾ - 13
Pressed St., pref.	98	Crucible St., pref.	79½ - 79⅞

* Ex dividend.

Dividends.—The International Steam Pump Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable May 1.

H. R. Worthington, Inc., has declared the regular semi-annual dividend of 3½ per cent. on the preferred stock, payable May 1.

The Vulcan Detinning Company has declared the regular quarterly dividend of 1¼ per cent on the preferred stock, payable April 20.

The Thompson-Starrett Company, New York, has declared the regular 4 per cent. semi-annual dividend on its preferred stock. The Board of Directors has recommended to the stockholders an increase in the common stock from $1,000,000 to $1,500,000.

Notes on Prices

Rope.—Business with manufacturers is keeping up in volume about as for past months without any special indications of a spring revival. The following quotations represent prices to the retail trade in the Eastern market for rope 7-16 in. in diameter and larger, with card advances for smaller sizes: Pure manila of the highest grade, 8½c. to 9c. per pound; second grade manila, 7½c. to 8c. per pound; hardware grade, 7c. to 7½c. per pound; pure sisal of the highest grade, 6½c. per pound; second grade, 6c. per pound; rove jute rope, ¼-in. and up, No. 1, 6½c. to 7c. per pound; No. 2, 6c. to 6¼c. per pound.

Linseed Oil.—The holding off of consuming manufac-

turers in placing large orders for oil has more than offset the diminished receipts of flaxseed, so that card quotations for jobbing lots in the Eastern market are only a cent higher than at the beginning of the year. The decline in the price of foreign oil, of which considerable has been imported to this country, has also had some effect in keeping prices of domestic oil lower than perhaps they would have been except for this influence. A general quotation for carloads of raw oil is 89c. for immediate delivery, while close buyers could get lower figures. Lower card prices have been announced as follows, New York, in 5-barrel lots or more:

	Cents.
State, raw	91
City, raw	91

Oil in lots of less than 5 bbl., 1 cent advance per gallon.
Boiled oil, 1 cent advance per gallon over raw.

Naval Stores.—Prices of turpentine in the local market have declined 5c. per gallon in sympathy with freer receipts of the crops at primary points in the South. The demand here has been for immediate requirements which are small. New York turpentine quotations in 5-barrel lots are as follows:

In oil barrels	$1.04½
In machine barrels	1.05

Less than 5-bbl. lots, ½ cent advance per gallon.

Rosins have been advanced in price, with moderate buying in New York. On the basis of 280 lb. to the barrel, common to good strained is quoted at $8.50 and grade D at $8.60 in the New York market.

The new plant of the Omaha Structural Steel Works, Omaha, Neb., is practically completed and will be in operation in about three weeks. The building is of steel construction and all equipment will be operated by individual motors. The company will fabricate structural steel for buildings and bridges.

The Miller-Owen Electric Company, 217-219 First avenue, Pittsburgh, Pa., dealer in electrical machinery and general repairing, is agent in the Pittsburgh district for the Kimble alternating current motors for Gordon and Universal presses, made by the Kimble Electric Company, Chicago.

The furnace of the Lawrence Iron Company, Ironton, Ohio, is making a remarkable record. It is running on basic, cast in chills, and for more than 600 casts not a ton has gone over one per cent. in silicon or 0.05 in sulphur. The greater part of the iron has been below 0.50 in silicon and 0.025 in sulphur.

The plant of the Western Stove Works, Peoria, Ill., has been sold at auction to F. E. & F. H. Avery, of that city, who desire to sell or lease the plant after the sale has been confirmed by the court. The plant is fully equipped for the manufacture of stoves and repairs.

The McClintic-Marshall Construction Company, Pittsburgh, Pa., with works in that city, also at Carnegie, Pa., and Pottstown, Pa., has opened a branch office in the Trussed Concrete Building, Detroit, Mich., in charge of R. B. Titsworth.

The Earlston Furnace of Joseph E. Thropp, at Everett, Bedford County, Pa., made 8456 tons of foundry iron in the month of March. This is a new high record for the furnace. It also made a record for low fuel consumption and low cost of labor.

The Youngstown Foundry & Machine Company, Youngstown, Ohio, has received a large contract for special machinery from the Inland Steel Company, Chicago.

No. 2 furnace of the Warwick Iron & Steel Company, Pottstown, Pa., which was expected to go out April 2, will not be blown out until late in the present week.

The Northern Iron Company, Port Henry, N. Y., blew out its Standish Furnace April 4, for relining and general repairs.

The Ironton Iron Company blew out its furnace at Ironton, Ohio, April 2, for relining.

New Publications

Textbook of the Principles of Machine Work.—By Robert H. Smith. Bound in cloth. Size, 5 x 8 in.; 388 pages; 434 illustrations. Price, $3 net. Published by the Industrial Education Book Company, Boston, Mass.

Textbook of the Elements of Machine Work.—By Robert H. Smith. Bound in cloth. Size, 5 x 8 in.; 192 pages; 204 illustrations. Price, $2 net. Published by the Industrial Education Book Company, Boston, Mass.

These two books have been brought out in an effort to supply textbooks covering the field of machine work, and the aim has been to give the beginner in these subjects the advantages of textbooks similar to those used in studying other older subjects, so that the fundamental as well as the advanced principles may be quickly acquired in a logical, systematic and progressive manner. In both books the student is told how to do things and the theory connects principles and practice. Machines, mechanisms and tools are graphically illustrated by original mechanical and prospective drawings and condensed tables describe them briefly and systematically. Condensed schedules which name the materials, the operations, the machines, the jigs, the fixtures and the tools give operations in machining and standard and typical problems in machine construction.

In both books numbered sections are used, which make it a simple matter to locate cross references. In the former book speed and engine lathes, with their various attachments and the operations performed by them, are described in the first half. This is followed by chapters on grinding and drilling machines, a special chapter being devoted to multiple spindle and radial drilling machines. Bolts and nuts, machine screws, counterboring and countersinking and calipering and thread testing are covered in two chapters, while the final chapter contains tables and other data used in machine work.

The other book gives the history and the origin of machine tools and the materials used in machine construction. This is followed by instructions for reading drawings and the use of measuring, laying out and operating tools. The next chapters, III. to V., inclusive, are devoted to chipping and tool grinding and machine filing and scraping and polishing. Instruction on the treatment of the various types of steel is given in Chapter VI., and the next chapter tells of the hand and machine methods of cutting off stock. Pipe and pipe fittings and scraping and bending occupy the next two chapters. Brazing, soldering and babbitting are discussed in Chapter X., while the next chapter is given over to the various forms of power transmission and instructions for aligning and leveling shafting and installing machines. The final chapter contains tables and data.

Inventors and Inventions.—By Henry Robinson. Published by the author, 41 West Thirty-third street, New York City. Paper covers; pages, 96. Price, 25 cents.

The author has here given a great deal of practical advice to inventors. He covers the whole field, from the conception of an invention through its design and financing to manufacturing and marketing. Pointers are given on successful manufacturing. A number of chapters treat of the methods by which inventors are robbed of the fruit of their brains. Caustic strictures are made on the lack of protection given by the Government to owners of patents. The book is profusely illustrated.

New Republic Iron & Steel Company Plant.—The Republic Iron & Steel Company will blow in its new blast furnace at Youngstown, Ohio, the fourth of the Hazelton group, about May 1. The open hearth plant at Hazelton will probably be started up in May. Four of the eight 60-ton furnaces will be operated to begin with.

The Detroit Iron & Steel Company has both its furnaces on Zug Island in operation, Furnace B having blown in on March 25.

Personal

Clyde M. Carr, president of Joseph T. Ryerson & Son, Chicago, is spending a few weeks in California.

W. A. Wilbur, president of the Bethlehem Foundry & Machine Company, South Bethlehem, Pa., announces that W. V. Knauss, treasurer, has resigned, to take effect April 1. Mr. Knauss retires after an honorable business career of over 45 years. Miss Iva E. Krause succeeds him as treasurer of the company.

Harry M. Lane, president of the Lane & Bodley Company, Cincinnati, met with a serious accident March 30. A large casting, being lifted in the shop, fell on his feet, mashing one foot off at the ankle and painfully injuring the other.

George K. Leet becomes secretary to Chairman E. H. Gary of the United States Steel Corporation, succeeding the late W. K. Fleming. Mr. Leet has been secretary to Assistant Secretary of the Treasury Andrew.

Wm. B. Cowles, for a number of years vice-president and treasurer of the Long Arm System Company, Cleveland, Ohio, has opened a consulting engineering office in Detroit.

Lyle W. Orr, formerly with the Reznor Mfg. Company, Mercer, Pa., has become manager of the Modern Tool Company, Erie, Pa., filling the vacancy caused by the death of Frank L. Gallagher.

J. B. Henry, who on April 1 withdrew from the sales department of the United Engineering & Foundry Company, Pittsburgh, is now superintending the construction of the large additions which the Union Steel Casting Company is making. Mr. Henry has been in the steel casting business all his adult life, having been employed in official capacities at the Alliance and Sharon plants of the American Steel Foundries, previously with the Union Steel Casting Company, and latterly with the United Engineering & Foundry Company.

F. R. Sites, formerly with the sales engineering department of the Riter-Conley Mfg. Company, Pittsburgh, Pa., has resigned, and commencing April 10 will be connected with the operating department of the American Steel & Wire Company, at Cleveland, Ohio.

The report that F. W. Hudson of Chicago had been appointed superintendent of the plant of the American Steel Foundries, at Sharon, Pa., is officially denied.

W. C. Du Comb, assistant engineer for the Standard Roller Bearing Company, has resigned to become connected with the Royerford Foundry & Machine Company of Philadelphia and Royerford, Pa., manufacturer of Sells roller bearings. Mr. Du Comb was engineer of the Riehlé Brothers Testing Machine Company for several years.

F. Charles Scribner, for the past three and one-half years general foreman of the gauge and tool departments of the Wells Bros. Company, Greenfield, Mass., has severed that connection and has accepted the position of inspector of gauges with the Colt's Patent Firearms Mfg. Company, Hartford, Conn.

Alexander E. Brown, president and general manager of the Brown Hoisting Machinery Company, Cleveland, who has been in ill health since last July, suffered a second stroke of paralysis March 31, but his condition is not regarded as critical.

A Firth-Sterling Steel Poster.—E. S. Jackman & Co., Chicago, sales agents for the Firth-Sterling Steel Company, McKeesport, Pa., have issued a dissertation on steel in novel form. It is a blue print, the letters appearing in white. The title is "Firth-Sterlingism." The gist of the dissertation is that credit for a good tool must be given to all connected with its preparation from the maker of the steel to the man who finishes it. It concludes: "The mission of a bar of steel has only begun when it is delivered to the buyer. At that point the seller's responsibility ceases and the buyer's responsibility begins. The outcome is beyond the control and responsibility of the maker of the steel. Superiority in steel is a fact. All steel is not alike. There is more in steel than chemists can find. Good steel came before laboratories. Good bread came before cook books. Good blacksmiths and good mechanics came before printing presses."

The New Lozier Plant at Detroit

The Lozier Motor Company formally opened its new plant at Detroit, Mich., April 3. The factory, which has been under construction since last May, commenced operations with a force of 450 men, which will be increased as rapidly as possible until all departments are in full operation. It is located on the Detroit Terminal Railroad on a site comprising 65 acres. It was built to enlarge the manufacturing facilities of the company, whose cars have heretofore all been built in the plant at Plattsburgh, N. Y. This factory will continue to operate as heretofore, but will build units for use in the Detroit works, the latter plant being the only one in which the completed cars will be turned out. The two factories at Detroit and Plattsburgh will have a combined output of 1000 cars for the coming season, all parts of which will be made in these factories from raw materials. The buildings, comprising the new Detroit factory, are fireproof, constructed of steel and concrete, the flat slab type of construction being here employed for the first time in an automobile factory. They were designed, and work was carried on under the personal supervision of Albert Kahn, architect and designer of many of the best known automobile plants.

The main building, two stories, covers the entire frontage of 800 ft. on Mack avenue, with side wings extending back approximately 200 ft. In this building are located the factory offices, restaurant, final assembling, physical and chemical laboratories and experimental departments, together with the body construction and finishing department. Building No. 2 is of one story saw tooth construction, covering 68,000 sq. ft., and contains the machine shop, chassis assembling, finished stock and chassis testing departments. Other buildings are devoted to power generation, heat treating, rough stock, garage and other purposes of this nature. The power building is equipped with two 350-hp. water tube boilers and Detroit stokers, one Hamilton-Corliss engine direct connected to a 625 K. V. A. Allis-Chalmers generator and one Laidlaw-Dunn-Gordon air compressor. All departments of the factory are operated by electric power. Ninety per cent. of the machinery throughout this plant is entirely new and of the latest type, installed entirely with the view to producing high-class motor cars.

The Wheeling-La Belle Steel Merger Off.—Negotiations which have been under way for some time looking to a merger of the interests of the La Belle Iron Works, Steubenville, Ohio, and the Wheeling Steel & Iron Company, Wheeling, W. Va., have been called off. At a meeting of the Board of Directors of the La Belle Iron Works, held at Steubenville last week, it was decided not to do anything in the matter for the present at least.

The Shenango Furnace Company, Pittsburgh, W. P. Snyder president, is circulating a booklet dealing chiefly with the iron ores of its Mesaba and Menominee range mines. The company's Bessemer ores are the Shenango, Tyrone, Webb and Whiteside, while the non-Bessemer group is composed of Wilpen, Webb and Whiteside for the Mesaba range, and Clifford and Antoine of the Menominee range. Of all of the above, analyses are given. The company's standard Bessemer and basic pig irons and the malleable pig iron of the Mabel Furnace are also described by analyses. Illustrations are given of the company's mining, coke, blast furnace and vessel properties.

The Sims Company, Erie, Pa., maker of steam specialties, has received an order from the John B. Stetson Company, Philadelphia, for an 8000-hp. feed water heater weighing 24,000 lb. This will be the largest feed water heater ever turned out by the company. Among other orders recently received was one for a carload of 18 feed water heaters for shipment to Sherman, Texas.

New Tools and Appliances

This is essentially a news department for which information is invited.

Commutating Pole Motor.—The General Electric Company, Schenectady, N. Y., has just brought out a new type of commutating pole motor which is especially designed for the severe service required in many industrial power applications. The special feature of these motors is that the commutating poles are connected in series with one another and with the armature, an arrangement which enables sparkless commutation to be secured over wide ranges of load and under adverse operating conditions, since the magnetizing force of the poles is in proportion to the armature current and may be employed to compensate for armature reaction. In addition a wider range of speed control is secured than is possible with motors of the non-commutating pole design. A fan mounted on the armature shaft within the pulley and bearing head secures internal ventilation and insures cool operation. The main field coils are wound on horn fiber spools and are well insulated, the winding being rendered moisture proof by a thorough impregnation with a special insulating compound. Before the coils are finally assembled they are armor wound with a single layer of enamel covered wire which serves the double purpose of protecting the windings from mechanical injury and assisting in heat radiation. The poles are wound with rectangular copper wire on horn fiber spools. Special care has been taken in the design to secure a commutator that would be entirely free from loose or high bars. The outer corners of the segments are rounded to prevent the mica insulation from chipping and the inner edges are notched to prevent short circuiting between the bars. There are also small grooves in both sides of the segments which serve to anchor the mica segments firmly, thus avoiding the possibility of high pieces of mica.

Induction Motor Starter.—An improved type of hand operated starting compensator for an induction motor has been recently placed on the market by the General Electric Company, Schenectady, N. Y. This compensator consists of an inductive winding with sub-voltage taps and a switch for connecting the taps to the motor. In use the motor is thrown directly from the starting tap to the line, the proper sub-voltage tap being permanently connected with the switch. This enables a reduced voltage to be applied to the motor to start it and bring it up to speed. The proper voltage to be used for starting is determined by trying all of the several taps with which the compensator is provided, and the one that is most suitable is secured by permanently connecting the corresponding tap to the switch. In designing the compensator care has been taken to insure the proper and effective protection of the motor. To prevent the motor from being thrown on the line by accident, the off position of the switch is located between the starting and the running positions, and an automatic latch holds the handle in this position. In this way it is impossible for the operator to throw the handle into the running position without first throwing it into the starting one. A system of spring actuated release levers attached to the switch shaft and an equipment of no-voltage and overload relays, which operate in conjunction with each other and with the hand operated mechanism, comprise the automatic protection. The motion of the operating handle toward either the starting or the running position is always opposed to the tension of the spring actuating the release levers, and if the handle is accidentally left on the starting position, the contractile action of the spring returns it to the off position immediately. The relays operate to produce a similar result. The no-voltage relay frees the release levers, and the spring immediately returns the switch to the off position, thus disconnecting both the motor and the compensator from the supply circuit and protecting them from the returning full line voltage. The overload relays which are inserted in the running circuit are designed to remain unaffected by the usual rush of current at starting, but can be adjusted to operate at a slight rise above the normal current and open the no-voltage relay circuit, the action of the spring returning the switch to the off position.

Speed Box.—The American Tool Works Company, Cincinnati, Ohio, has recently brought out a new eight-change speed box which is intended to be applied to its 4, 5, 6, and 7 ft. plain and full universal triple geared radial drills. The box is of the cone and tumbler construction and provides eight speeds, each of which is instantly obtained by shifting the tumbler lever. The speeds are secured through four change gears on the lower shaft and three on the tumbler which is of the compound type. All the driving gears are of special steel and are of the Brown & Sharpe 20-deg. involute pointed tooth type. The tumbler lever is located in its various positions by a notched plate which prevents the gears from being improperly engaged and when the tumbler is located, it is securely locked in position by a latch pin. The speeds can be easily changed without shock, as the cone gears rotate while the speeds are changed. An auxiliary drive between the pulley and the cone shaft which is automatically engaged or disengaged by the raising and the lowering of the tumbler lever while changing speeds enables this to be done. The drive is positive in its action and operates through a friction clutch. A shock absorber in the line of drive absorbs all shocks and strains, thus insuring long life to the driving mechanism. This style of speed box is interchangeable with the four-step cone pulley regularly furnished and also with the four-speed friction type of speed box and will transmit enough power to enable a 6-ft. radial drill to pull an 8-in. pipe tap.

Heavy Double Crank Press.—The Max Ams Machine Company, Mount Vernon, N. Y., has placed on the market a new line of presses which is especially designed for stamping operations of the heaviest character, such as blanking and forming automobile parts, stair risers and metal ceilings and shingles. The frame is of the builder's standard built-up type, reinforced by four steel rods to take the entire working strain. The slide is gibbed and has parallel adjustments for raising and lowering. The striking surfaces of the clutch, which is of the sliding block type, are lined with hardened steel faces, and to prevent their edges from tearing off the block is pushed a sufficient distance from the wheel to give clearance. A new safety trimming device, which compels the operator to have both his hands on the levers to start the press, forms a part of its equipment. In this way it is impossible for the operator to have his hands between the die and the punch at any time while the press is in operation, and if the weight of the pieces necessitates the employment of two men, the machine can be supplied with an extra set of levers placed in a convenient location. The new press measures 60 in. between the uprights, has a slide stroke of 3 in. and in complete working order weighs approximately 40,000 lb.

Combination Drill.—The Standard Tool Works, Standish, Maine, has recently developed a combination drill, which is made by using two sizes of specially shaped steel, the shank of the smaller one being turned taper and fitting into the larger drill as if the latter were a socket. The object of the smaller drill is to relieve the center in the same way that small holes are often drilled to make it easier for the large drills to enter the work.

New Coke Rates.—Effective May 15, rates of freight on coke from the Connellsville region to Chicago will be $2.50 per net ton on furnace and commercial coke, the rate to Toledo will be $1.95 a ton and to Detroit will be $2.10 on both furnace and commercial coke, instead of $2 a ton on furnace coke and $2.25 a ton on commercial coke, as at present. There will be no change in the freight of coke to Cleveland, which will remain at $1.65 a ton as at present.

The Cambria Steel Company had all its eight furnaces at Johnstown, Pa., in blast April 1, Nos. 1 and 7 having blown in in March.

The Mackle-Crawford Construction Company has removed its office to room 221 Grant Building, Atlanta, Ga.

Elongation and Ductility Rail Tests*

Requirements of the New York Central Lines

BY P. H. DUDLEY.

The acceptance of rails under a single drop test of 2000 lb., falling a given hight, rejects only those of less ductility than is required to take up the energy of the drop before rupture. This range of rejections varies from a small percentage of 1 to 3 per cent. of the output, and all in manufacture should be avoided.

Experience has shown that there are likely to be a number of heats of Bessemer and occasionally a melt of open hearth rails in which the ductility is just sufficient to absorb the energy of a single blow of the drop and pass the rails. The butts, however, will break from a second blow without giving any increased elongation, while a number of the rails are so severely strained by gagging in the straightening presses that the strains develop into checks and detailed fractures from service in the tracks.

The percentage in plain Bessemer ranges from 2 to as high as 15 per cent. in some rollings, and is yearly increasing in this class of rails. Eighty to 90 per cent. of the heats of Bessemer or of the melts of open hearth require two or more blows under the drop to break them, giving a desired range of 12 to 18 per cent. of ductility in the rails for service as girders, which experience shows has rendered excellent service in New York Central lines, where the temperatures often fall to 30 and 40 degrees F. below zero. It is only natural that railroad officers should try to secure as good material as was possible from 1890 to 1900, or better, in rails for their constantly increasing wheel loads and speeds.

The 1890 specifications of the Boston and Albany and New York Central & Hudson River for the low 0.06 phosphorus and 0.60 to 0.65 carbon Bessemer rails, required a drop test from each heat and that 90 per cent. should stand a test of 2000 lb. falling 20 ft. without breaking for either the 80, 85 and 100 lb. sections. To this requirement was soon added the proviso that where a butt broke, yet gave 4 per cent. maximum elongation per inch, the rails of the heat would be accepted. It is but proper to say that while a few of the rails had a minimum range of 4 per cent. ductility, the majority had from 8 to 16 per cent., and comparatively few breakages occurred. The surface wear and flange abrasion were of slow rates, the rails lasting two and three times as long as more recent Bessemer rails.

To carry the present high speed wheel loads, the former minimum elongation of 4 per cent. per inch has been raised to 6 per cent., for the maximum inch or two consecutive inches must each give 5 per cent. The ductility of the metal must be exhausted in the test butt from Bessemer heats in which the equivalent of one-tenth of 1 per cent. of metallic titanium has been used in the bath of steel. The range of ductility secured in this steel is the minimum specified to 18 per cent per inch, though the range of the majority of the heats is from 11 to 16 per cent. Of the Bessemer heats each, according to weight of section, makes from 18 to 30 rails accepted or rejected by one ductility test.

The basic open hearth melts of 60 to 80 tons each, making from 100 to 150 rails, according to section, are accepted or rejected upon the results of three ductility tests, one from the second ingot, one from the middle ingot of the melt, and a third from the next to the last ingot teemed. To accept the rails of the melt each test must show 6 per cent. maximum elongation for 1 in., or 5 per cent. each for 2 consecutive in. The ductility of the metal is exhausted in rotation from each of the different tests of the melt, and we thus ascertain the general uniformity of the steel of the first to the last teemed. This has tested, but not confirmed, a published statement that the first steel teemed is liable to have so high a temperature that it will be brittle; while the middle ingot will have a proper temperature and be tough, the last ingot will be teemed of steel so cold that it will be brittle. This does not seem to apply to these large melts of rail steel, as shown by the ductility tests. Basic open hearth rails have been rolled under these specifications at Bethlehem, Buffalo and Gary.

The three tests per melt on the open hearth rails call attention definitely to several conditions of mill practice which in hot metal must proceed at the right temperature in a logical and orderly manner. A melt or two at first did not pass; but the causes for failure could be quickly ascertained and remedied in the following melts, the making and rolling of the steel proceeding in a more satisfactory manner to both the manufacturer and customer. The specifications provide that a distinction must be made between a chilled butt and one that is brittle, before acceptance or rejection of rails, while the full ductility tests give the low as well as the high range —facts not before available for the manufacturers to study, to guide their efforts to secure the desired range.

The specifications are intended as an aid to good commercial work in manufacture for the necessary quality for present service as well as output. Attention is called to good mill practice after the ingots are teemed and set on top; they should be promptly stripped, weighed and charged into reheating furnaces. This is to avoid unnecessary cooling of the metal, developing large shrinkage cavities in the ingots from the inexorable law that molten or hot steel has a greater volume than when cold.

The management of one rail mill has organized a railroad service for uniformly prompt delivering and charging into the reheating furnaces of its large ingots, with the result of nearly entire elimination of piped rails, under the commercial discard.

* Submitted to the convention of the American Railway Engineering and Maintenance of Way Association, Chicago, March 22, 1911, as an appendix to the report of the Committee on Rail.

The consolidation of the Bucyrus Steel Castings Company and the Carroll Foundry & Machine Company, Bucyrus, Ohio, which has been under consideration for several weeks, was effected April 1. The former company took over the latter, but the consolidated company will bear the name of the Carroll Foundry & Machine Company. The capital stock will be increased from $200,000 to $500,000. The former officers of the Bucyrus Company will hold the same positions in the new company, as follows: President and manager, P. J. Carroll; vice-president, Frank P. Donnenwirth; secretary and treasurer, W. A. Blicke.

The Bessemer gold medal of the Iron and Steel Institute will this year be awarded to Prof. Henri Le Chatelier, the eminent French metallurgist, in recognition of his great services in the advancement of metallurgical science. The presentation will be made by the Duke of Devonshire, president of the Institute, at the annual general meeting to be held in London in May, 1911. The Andrew Carnegie gold medal for 1910 will also be awarded at the same meeting, the recipient being Felix Robin, Paris.

The borough of South River, N. J., has placed an order for pumps for its new water works with the Buffalo Steam Pump Company, Buffalo, N. Y. This equipment consists of two 5-in. two-stage centrifugal pumps, each having a capacity of 800,000 gal. of water per day against a total head of 135 lb. The pumps will be driven by 75-hp., 1700 rev. per min., Fort Wayne motors.

Canadian advices state that a syndicate which aims to bring the independent nail works of the country into a common ownership has made an offer for the property of the Maritime Nail Company, at St. John, New Brunswick.

The Lackawanna Steel Company, Lackawanna, N. Y., now has four of its blast furnaces active. No. 2 Furnace was blown out April 1.

Three of the six Ensley furnaces of the Tennessee Coal, Iron & Railroad Company were in blast April 1, No. 4 having blown in on March 4.

The Triple Supply Convention

LOUISVILLE, KY., April 3, 1911.—The triple convention of the American Supply and Machinery Manufacturers' Association, the Southern Supply and Machinery Dealers' Association and the National Supply and Machinery Dealers' Association opened here this morning with an interesting session, which brought out some decided opinions on legislation affecting business. The meeting was formally opened with prayer, and there followed an address of welcome by Augustus E. Willson, Governor of Kentucky, whose happy manner of welcoming the delegates brought out considerable applause. A representative of the Mayor of the city also made an address of welcome, which was responded to by William Heyburn of the Belknap Hardware & Mfg. Company, Louisville. Mr. Heyburn spoke in decided terms, criticizing the laws curtailing the privileges of manufacturers' associations. He said:

The laws of the country are such that there are limited opportunities for associations of the kind you represent. Germany has definite laws, and business organizations are licensed. Their purposes are definitely outlined and they are given definite privileges. I have never been able to see why our own lawgivers are so blunt in their legislation against trade associations.

Mr. Heyburn went on to say that the laws governing manufacturers' associations were not only crude but unfair. He gave it as his opinion that the discriminations against manufacturers by legislators made it necessary for the formation of trusts by manufacturers for self-protection. The present laws, he stated, do not apply to all classes of business, and they might at least have the recommendation of being uniform. Referring to the formation of monopolies again, the speaker stated that he did not wish to assert that such combinations were bad institutions, but rather indicated the trend of business, coming about because agreements necessary to manufacturing interests are not permitted. The speaker concluded by asking the members to use all their power to bring about legislation as regards business associations that will be fair.

Edward C. Hinman, American Steam Pump Company, Battle Creek, Mich., remarked that there are men in Washington having power in legislative affairs who never manufactured anything, never employed men and who never signed a payroll. He added that he was glad the time had come in business when there was no North and no South.

W. M. Pattison, president of the National Dealers' Association, and H. C. Clark, president of the Southern Dealers' Association, also spoke in response to the addresses of welcome.

John Trix, American Injector Company, Detroit, Mich., who recently returned from a trip to Panama and South America, spoke in praise of the manner in which the canal construction operations are being conducted. He said that men are too prone to make accusations of graft, when the public's money is being spent on public utilities. His investigations taught him that the expenditures for the canal work are being carefully handled. The speaker added that he had been 31 days at sea and had not seen the American flag on a vessel. He hoped that the associations would advocate that the American Congress have the good sense to pass necessary laws subsidizing the merchant marine. He said that every piece of German freight that goes into the hold of a German vessel is carried at a reduced freight rate.

George Puchta, Queen City Supply Company, Cincinnati, in talking of the business outlook, asserted himself to be an optimist in the fullest sense. Said he: "We have seen a good year's business and good crops. The Canadian reciprocity question will soon be solved satisfactorily, I hope. The currency situation, I think, is about to be solved, so that when we need money most we can have it, and nothing should stand in the way of a good and growing business in the near future."

This afternoon the dealers' associations held separate meetings and organized. The Executive Committee of the Manufacturers' Association held a session which lasted all the afternoon.

The principal event of the afternoon session of the Southern Dealers' Association was the report of Secretary-Treasurer Alvin M. Smith, Smith-Courtney Company, Richmond, Va., which was in part as follows:

Report of the Secretary of the Southern Dealers

We have had a healthy growth in our membership, having received 11 new members in the past year.

While business does not appear to be by any means normal, yet from reports received last year was a much better one than most of us had experienced in the previous three years. We suffered fewer declines and received some advances which, with larger profits secured and fewer bad debts charged off, made us more optimistic for the future. The consensus of opinion is that 1911 will be better than 1910, despite the weighty cases before the Supreme Court and the adverse railroad rate decision, which many think is holding back capital and stagnating business in new enterprises.

Our relations with other jobbers' associations are very harmonious and we are assisting them, as they are us, in all matters of common interest.

CASH DISCOUNTS.

We have succeeded in securing cash discounts from a number of manufacturers who were not allowing same at this time last year, and some who had withdrawn same have at our request reinstated it on condition that our members live up to the terms of payment.

The principal trouble in the securing of cash discounts seems to be that the jobber does not live up to the terms imposed by the manufacturer, who becomes disgusted and withdraws it. It is therefore incumbent upon us to fulfill our part of the contract if we expect to receive the concession. Considering the fact that our own customers impose upon us to such an extent in the case of cash discounts, it seems to me we should get together and not only pay our own bills in the required time, but also make our customers do so

We have been called in on several occasions to arbitrate claims of our members against public service corporations and have been successful in arranging such grievances satisfactorily. We have urged conservative legislation based on fairness to such companies. The prosperity of the South has been largely promoted by our public service corporations, and we should not join in the universal howl against them but treat them fairly and urge our legislatures and Congress to do so.

Machinery profits, with few exceptions, remain small. We have used every power of persuasion on the manufacturers and they seem to think we should be able to receive as a personal favor the small profits they give us. I would recommend that all of us who stock machinery insist on getting a just margin of profit as a premium for being able to make quick deliveries.

While we of the South were considerably disappointed at New Orleans not receiving the Government's support for a World's Panama Exposition in 1915, we have every reason to believe that the opening of the Panama Canal will mean an era of new and greater prosperity for the South, particularly the Gulf States. The fact that New Orleans is 2000 miles nearer the center of the population than San Francisco and is also 2000 miles nearer the Panama Canal than her Pacific Coast competitor is pretty good evidence that the great bulk of our South and Central American freight passing through the canal will go through the Gulf ports of Florida, Alabama, Louisiana and Texas, and the South should dominate this trade and she undoubtedly will.

The Sixty-first Congress failed to pass the necessary legislation to enable the Post-office Department to start an experimental parcel post, and it is to be hoped the Sixty-second, now convening, will also refuse to sanction this outrage. Our association will continue its efforts in conjunction with other associations to prevent any parcel post extension. Such a calamity would mean a largely increased postal deficit and further delay 1-cent letter postage.

It is certainly to be hoped that during the next year we will try to get better profits on staple goods, such as shafting, spikes, bolts, nuts, nails, &c. It is ridiculous to hear of a jobber selling shafting out of stock at 50 per cent. off, when it cost him 57 per cent. in carloads, and yet we are doing it every day. This same foolish margin of profit is being got on all the above lines. Let us reform and begin with the staples.

The National Dealers' Association

This association spent most of the afternoon in organizing its separate convention.

The annual reports of the officers were received, and some little time was occupied in discussing resale prices. The meetings of both of the dealers' organizations were executive sessions.

The Manufacturers' Association

LOUISVILLE, KY., April 4, 1911.—(*By Telegraph.*)—The Manufacturers' Association formally organized this morning. The session was given over largely to the discussion of employers' liability for accidents.

Secretary F. D. Mitchell, in his annual report, showed that the organization had increased 25 per cent. in membership, and eight manufacturing companies were admitted to the association at the meeting. President S.

P. Browning, Ohio Valley Pulley Works, Maysville, Ky., announced the convention committees, after which the meeting was opened for general discussion.

The question of reimbursing dealers for depreciation in stocks of machinery in the event of a decline in price was brought up by several manufacturers, all of whom declared themselves unfavorable to any such plan. It was argued by one speaker that such action would only be warranted providing the dealers agreed to divide their profits with manufacturers on stocks on hand when prices advanced. Another suggested that even though the dealers acquiesced to such a proposal, it would be hard to make adjustments in the event of price changes.

The question of employers' liability in cases of accident was brought up by John Trix, who declared that most of the State laws covering workmen's compensation are unjust, and commended the workmen's compensation laws of Germany.

Edward C. Hinman, American Steam Pump Works, Battle Creek, Mich., said that his company maintained a humane policy in treating with its injured workmen, and had never had a lawsuit with one of its employees. He explained as follows: "If one of them is ill, we see that he gets proper care and pay for it. If he dies, we bury him, and let his fellow workmen attend the funeral. We pay the damages if we maim them, and we are always fair. If all manufacturers were humane there would be no need for legislation."

S. K. Broderick, Broderick & Bascom Rope Company, St. Louis, said that manufacturers had more to fear from unjust legislation than from ambulance chasing lawyers. He believed that the best way to solve the problem was to encourage industrial training and get closer to the needs of the workmen, adding that manufacturers pay more attention to the whole machine and neglect the needs of the individual.

Melville W. Mix, Dodge Mfg. Company, Mishawaka, Ind., said that a prominent law maker had declared to him that the manufacturers would only charge their compensation taxes in their business and the ultimate consumer would eventually pay the bill. Mr. Mix was inclined to take the same view, as it would be only natural for the manufacturers to apportion the tax to their overhead expenses. The only difficulty would be that different laws in different States might create unequal competition.

During the meeting President Browning stated that in the past the association had given most of its attention toward recruiting new members and he added that the time had come for the organization to make itself useful to the members in a business way. A resolution of regret was passed on the death of A. S. Upson president, Upson Nut Company, Cleveland, Ohio.

The National Dealers' Association

This organization at its meeting talked at length on manufacturers selling in competition with accredited dealers. Wallace M. Pattison, W. M. Pattison Supply Company, Cleveland, Ohio, stated that he believed the association ought to take a firm stand in influencing the manufacturers to recognize the dealers and refrain from entering into competition with their agencies. He mentioned means that had been taken by dealers in meeting manufacturers' competition by quoting prices from catalogues of mail order houses, and said that dealers were often obliged to take such methods of protecting themselves when the manufacturers were protected by price agreements and the tariff.

The president called attention to the increasing expenses of the machinery selling business and said that a two per cent. profit is all that can be made on many sales.

There followed a general discussion on the expense of doing business and then the question of manufactuers' competition came up. It was pointed out that following a price decline the machinery and supply dealer was at the mercy of the buyer, as the manufacturer was ready to dispose of stocks at the reduced quotations. The consensus of opinion seemed to be that the dealers should decline to do business with a manufacturer unless the latter agreed to share losses in case of a decline or give the dealer a chance to recoup by refraining from underselling in the dealer's territory.

The Southern Dealers' Association

This association at its morning meeting listened to an address on "The Cost of Doing Business and the Proper Method of Handling Expense Items," by W. P. Simpson, C. T. Patterson Company, Ltd., New Orleans, and a paper on "The Proper Method of Compensating the Traveling Salesmen," by E. Howard Smith, Superior Supply Company, Bluefield, W. Va.

The afternoon was given over to a question box discussion during which the one cent letter postage question was talked over to some extent.

To-morrow the three associations will elect officers and hold a joint session. P. A. W.

The Yale & Towne Mfg. Company Will Establish a Canadian Plant

The Yale & Towne Mfg. Company, Stamford, Conn., of which Henry R. Towne is president, has had under consideration for some years the question of establishing a plant in Canada, and has recently decided to do so. This plant will be located at St. Catharines, Ont., and will be designed to conduct the Canadian business of the company, which is already considerable and is steadily growing. The chief products of the company comprise locks of all kinds, builders' hardware and chain pulley blocks, facilities for the production of all of which will be provided in the St. Catharines plant, where the methods of production and standards of quality so long established in the parent plant will be maintained and continued. The ground for the plant has already been acquired, arrangements for construction are under way, and it is hoped to have the plant in effective operation early in 1912. When this point is reached, due announcement will be made to the Canadian customers of the company, who in the meantime will continue to be served from the parent plant through its general offices, 9 Murray street, New York.

The Cambria Paint & Color Company's Improvements

The Cambria Paint & Color Company, Johnstown, Pa., having recently disposed of its site to the Baltimore & Ohio Railroad, which desired the ground for the purpose of enlarging freight yards, has secured another location, to which it has moved part of its buildings and equipment. The old buildings thus removed comprise two, one of which is 38 x 90 ft. and the other approximately 38 x 200 ft. A new brick building, 50 x 150 ft., to be used for grinding and mixing paints and colors, and another, 32 x 100 ft., will shortly be erected, the contract for their construction having been placed with a local builder. New lead mills and some other equipment will be required. New motors will also be ordered for the mixing department, while the grinding of colors will be done by steam power. It is expected that the new plant will be completed and ready for operation about the middle of the year.

The Central Foundry Company's affairs are now likely to be adjusted shortly. Judge Hough, in the United States Circuit Court, signed an order Tuesday authorizing the receiver, Waddill Catchings, to accept the offer of Frederick H. Buss and Daniel A. Homan to buy the property of the bankrupt corporation in its entirety. The amount named as the purchase price is $1,659,500, this covering all the assets except the stock of the Standard Radiator Company. This will be followed by the reorganization of the company.

The Morgan Engineering Company, Alliance, Ohio, states that it has not purchased any stock in the Shull Steel Castings Mfg. Company, Canton, Ohio, and never had any interest in it.

Workmen's Accident Compensation

A Review of Bills Proposed by Commissions in Seven States

P. Tecumseh Sherman, formerly New York State Labor Commissioner, prepared for a recent issue of the *Survey*, New York, a review of the reports of the various State commissions on employers' liability for accident, or rather employees' compensation for works accidents. Mr. Sherman goes at length into an analysis of the various bills, commenting on their resemblances and differences and pointing out the causes for the latter. We have referred from time to time to the progress of the work of the commissions in the various States and to features of the bills as they were reported, but Mr. Sherman's summary is of special value in bringing the details of the seven bills together for ready comparison, and we reprint below that portion of it which presents the main features of each. The New York law, applying to certain dangerous trades, which was recently declared unconstitutional, is summarized at the beginning for purposes of comparison:

New York

The New York law applies only to a few exceptionally hazardous occupations and industries, and only to those injuries therein due to the fault of the employer or of "fellow servants," or to "trade risks." The "compensation" liability which it imposes is additional to the older liability for damages, and the option is given the injured employee, after the accident, to choose between them. It provides for compensation as follows:

In case of death: If there are total dependents, a lump sum equal to three years' wages, but not to exceed $3000. If only partial dependents, a proportion of the foregoing. And if no dependents, medical and funeral expenses not to exceed $100.

In case of disablement: Weekly payments of 50 per cent. of wages if the disablement is complete, or of 50 per cent. of impairment of earnings if it is partial, but of not more than $10, beginning at the end of the second week and continuing during disablement, but not longer than eight years.

Disputes are to be settled by arbitration or by action at law. A judgment in an action is to be for a lump sum only, equal to the sum of the payments prospectively due.

Illinois

The report of the Illinois Employers' Liability Commission presents a bill which applies to all employments in the course of trade or business; to all employees not "casual," and to all accidental injuries and deaths caused in the course of the employment, except those due to the serious and willful misconduct of the injured employee, and those not causing disablement for more than one week.

It is a mixed "negligence" and "elective compensation" law. It abolishes the defenses of "assumption of risks" and "fellow servant" in the law of negligence, and then gives the employer the option to elect liability for compensation alone, upon condition that he manifest such election in a prescribed public manner. In default of such election the employer is made liable under both laws. If he elects the compensation liability, a contract is presumed between him and each of his employees (except such employee as by written notice expresses a contrary election on his part) to substitute that liability for all others, except where the injury is caused by the willful failure of the employer to comply with "statutory safety regulations," in which case the employer is to be liable for full damages. The compensation payable is as follows:

In case of death: To a widow, parents and descendants, if any, toward whose support the deceased has contributed within five years, three years' wages but not less than $1500 nor more than $3000. Otherwise, to other collateral dependents, a proportion of the foregoing. And if no such dependents, not more than $150 to the personal representative of deceased. The sum above provided for as compensation to dependents is payable for the first six months in installments, like wages, and thereafter in a lump sum or in installments, at the option of the person entitled thereto.

In case of disablement: Periodical payments from the date of and continuing during disablement, or until the sum of the payments equals the amount which would have been due in case of death,[1] as follows: If disablement is complete a weekly payment of 50 per cent. of wages, but not less than $5 nor more than $10, for eight years; and thereafter, if complete disability continues, 8 per cent. of the amount which would have been due in case of death, payable in monthly payments during life. The loss of both eyes, or of both hands, &c., is always to be deemed complete disablement. If disablement is only partial, a weekly payment of 50 per cent. of the impairment of earnings, not to continue longer than six years; but other definite proportions of wages in weekly payments for fixed periods are prescribed for certain specified injuries (*i.e.*, the loss of a hand, of an eye, &c.). Where weekly payments have continued six months and the disablement is determined to be permanent, an option is given the injured employee to demand in settlement a lump sum equal to four years' compensation, less the amount of payment received.

Also, for the first 90 days, the employer is to furnish necessary medical care, appliances, &c.

Compensation may be determined by agreement. Disputes must be settled by arbitration.

This bill did not receive the approval of a majority of the commission, which therefore does not recommend it for enactment. The employers on the commission objected to that provision which would leave an employer liable for damages for an accident due to his willful failure to comply with "statutory safety regulations." The labor representatives on the commission filed two sets of objections to the bill. Two of them endorsed the demands of the Chicago Federation of Labor, that an advanced "employers' liability law" should precede a "compensation law." Four of them, on the contrary, objected that the "compensation" liability should be made compulsory instead of elective, and that the compensation provided ("three years' wages" for death and "four years' wages"[2] for complete disability) would be inadequate.

Wisconsin

The report of the Special Committee on Industrial Insurance of the Wisconsin Legislature recommends a bill which applies to all employments; to all employees except those whose employment is but casual or not in the usual course of the trade, business, profession or occupation of the employer, and to all injuries and deaths proximately due to accidents incurred where the employee is performing service growing out of and incidental to his employment, unless caused by willful misconduct (whether of the injured employee, of a fellow servant, of the employer, or of a stranger).

It is a mixed "negligence," "elective compensation," and "compulsory compensation" law. It abolishes the defenses of "assumption of risks" and "fellow servant" in the law of negligence (except as to railroads, as to which those defenses have already been modified); then imposes instead the compensation liability alone upon the State, and each county, city, town, village and school district therein, and then gives every private employer the option to elect liability for compensation alone, upon condition that he manifest such election by filing notice with the Industrial Accident Board, which notice binds him until withdrawn in the manner in the bill prescribed. And unless an employee, at the time of hiring, notifies the employer in writing of his election not to be subject to the compensation law, the liability thereunder is to be the exclusive remedy against the employer for accidental injuries and deaths. It is to be noticed that this leaves the employer liable for damages under the law of negligence, as amended, for accidents due to his "willful misconduct." The compensation prescribed is as follows:

In case of death: If there are total dependents, a sum (less the amount of any payments for disablement previously made)

[1] The effect of this provision upon the following provisions is uncertain.

[2] A careful study has failed to reveal any such provision in the bill. But what the bill does provide is a conundrum, and this may be the correct answer.

equal to four times the deceased's average annual earnings (to be taken at not less than $375 nor more than $750), payable in weekly installments, unless the Industrial Accident Board shall direct payment in gross. Wife, husband and children, under certain conditions, are to be conclusively presumed to be total dependents. If there are only partial dependents, the foregoing compensation is to be proportionately reduced; and if there are no dependents, the expenses of burial, not to exceed $100.

In case of disability: Nothing for the first week. Thereafter weekly payments as follows: If the disablement is complete, of 65 per cent. of average weekly earnings, or if it be so complete as to render the injured person so helpless as to require a nurse, of 100 per cent. of such earnings; if the disablement is only partial, the foregoing payments to be proportionately reduced; such payments to continue during disablement, but not longer than 15 years, nor to exceed in the aggregate four years' average earnings. (Average yearly earnings are to be taken at not less than $375 nor more than $750; and average weekly earnings, at one fifty-second thereof.) Payments may be withheld for 29 days after disablement, and if the injured employee recovers in the interval no payment is to be due.

In addition, the employer must furnish necessary medical and surgical treatment, medicines, appliances, &c., for 90 days; and in case of his failure to do so he is to be liable to others for the cost thereof.

If, after permanent disablement, death results from an independent cause, the employer is nevertheless to be liable for compensation as for death, less the amount of compensation for disablment already paid.

A State Industrial Accident Board is established, to consist of three members. Every compromise (settlement?) of a claim for compensation is subject to review by this board within one year. And every dispute concerning compensation is to be determined by it, subject to review by the courts upon certain questions of law only. Voluntary mutual insurance schemes are permitted, but not as a substitute for the legal liability.

New Jersey

The report of the New Jersey Commission on Employers' Liability recommends a bill which applies to all employments, to all employees except "casual," and to all injuries or deaths in the course of the employment, unless intentionally self-inflicted. Like the Illinois bill, it is a mixed "negligence" and "elective compensation" law. It abolishes the defenses of "assumption of risks" and "fellow servant" and restricts the rule of "contributory negligence" in the negligence law, and then provides that employer and employee may contract for the "elective compensation" liability alone, and that such a contract shall be presumed in every case, unless a contract to the contrary is made in writing. The compensation payable under this bill is as follows:

In case of death: If there are total dependents, weekly payments of varying proportions (from 25 to 60 per cent.) of wages, depending upon the number and relationship of the dependents, but of not less than $5 nor more than $10, and not to continue longer than 300 weeks. If there are only partial dependents, such weekly payments are to be proportionately reduced. And if there are no dependents, not more than $200 for expenses of last illness and burial. Children over 16 and non-resident alien dependents are not to be deemed dependents.

In case of disablement: Weekly payments, beginning at the end of the second week, of 50 per cent. of wages if the disablement is complete, but of not less than $5 nor more than $10, and to continue during disablement but not longer than 300 weeks, if the disablement is temporary, or 400 weeks, if it is permanent. If the disablement is only partial, the foregoing rates are to be proportionately reduced;—but in certain cases (i.e., the loss of a hand, a foot, or an eye, &c.) 50 per cent. of wages for definite numbers of weeks is specified.

In addition the employer must furnish necessary medical and hospital services during the first two weks, not to exceed $100 in cost.

Payments may be commuted for a lump sum only where, upon application, the court decides it to be "in the interest of justice."

Compensation may be determined by agreement. Disputes are to be settled by the courts "in a summary manner."

The representatives of labor on the New Jersey commission objected to that provision in the bill which fixes the maximum compensation in case of death at $10 per week for 300 weeks, or $3000, and contended for a maximum of 400 weeks, or $4000.

Minnesota

The report of the Minnesota Employees' Compensation Commission recommends a bill which applies to all employments in industries conducted for gain or profit (nominally only to those which are dangerous, but every industrial employment in which an accident shall occur is naïvely declared to be dangerous); to those employees only who are commonly known as laborers and workmen, or technically as "servants," and to all personal injuries arising out of and in the course of the employment, unless occasioned by drunkenness or purposely self-inflicted (both with some qualifications).

It is a strict "compulsory compensation law," and, where it applies, is exclusive of all other liabilities. The compensation payable is as follows:

In case of death: Funeral expenses, not to exceed $100, and: If there are total dependents, periodical payments (not less frequently than monthly) of 50 per cent. of wages, continuing during the condition of dependence, but not longer than five years nor to aggregate more than $3000. If there are only partial dependents the foregoing payments are to be proportionately reduced. And if there are no dependents, medical and hospital expenses, not to exceed $100.

In case of disablement: Medical and hospital expenses, not to exceed $100, and: If the disablement is complete, periodical payments (as above) of 50 per cent. of wages (but the annual amount of compensation never to exceed 50 per cent. of $2000), commencing at the end of the second week and continuing during disability but not longer than five years. If the disablement is only partial, the payments are to be 50 per cent. of the decrease in wages (or if wages exceed $2000, 50 per cent. of the decrease below $2000). But the percentage of wages is to be increased in certain specified cases of maiming.

Payments may be commuted for a lump sum or by the purchase of an annuity, but only with the approval of the Board of Arbitration.

A system of boards of arbitration is established, with one board composed of three officials in each county, and a code of procedure therefor is provided. Settlements and agreements as to compensation are subject to the approval of the proper board, and all disputes are to be determined in first instance by that board, with the right of appeal to the courts.

Detailed provisions governing the insurance of the liability for compensation are laid down. Voluntary mutual insurance schemes are permitted upon conditions, but not as a substitute for the legal liability.

One of the three members of the Minnesota commission objected to the bill on the following grounds: 1. That some adaptation of the German system of compulsory insurance is preferable. 2. That industrial chaos is to be feared if the bill should be enacted and the law subsequently declared unconstitutional. 3. That the question of cost has not yet been adequately considered.

Massachusetts

The Report of the Massachusetts Commission on Compensation for Industrial Accidents presents no bill. The commission expresses itself as greatly impressed by the pronounced opposition of both employers and employees to the tentative draft of a compensation bill which it published some weeks before its report, and recommends that further investigation and study should be undertaken before a measure is submitted for enactment.

The tentative draft bill referred to applies to every employment in which the employer has more than five persons continuously in his employ for at least three days; to all employes except those who by reason of advanced age, &c., are more liable to accidents or to more serious consequences from accidents, and who have, with the approval of the Accident Board, agreed with their employers not to claim the benefits of the act; and to all injuries arising out of and in the course of the employment, except those due to the injured employee's deliberate intention, his deliberate breach of statutory regulations, or his intoxication.

It is a "compulsory compensation" law; and the liability imposed is exclusive of all others, except where the circumstances are such that the employer would be liable at "common law," in which event an option is given the injured employee either to sue for damages at common law or to claim compensation.

The compensation payable is as follows:

In case of death: If there are total dependents, weekly payments of 50 per cent. of wages, but of not less than $4 nor more than $10, for 300 weeks. Wife, husband and children are to be deemed total dependents. If there are only partial dependents, such weekly payments are to be proportionately reduced. And

if there are no dependents, expenses of last illness and burial, not to exceed $200

In case of disablement: Weekly payments, beginning at the end of the second week, of 50 per cent. of wages, but of not less than $4 nor more than $10, if the disablement is complete; or of 50 per cent. of impairment of earnings if it is only partial; to continue during disablement, but not longer than 300 weeks from the date of accident, *i.e.*, for 298 weeks.

In unusual cases a weekly payment, after it has continued for six months, may be commuted for a lump sum, subject to the approval of the Accident Board.

All insurance policies, which cover the liability of employers under this proposed law, must make the insurance company liable directly to the injured employee.

A State Accident Board of three members is established. Settlements and agreements as to compensation are subject to the approval of that board. All disputes are to be determined in first instance by a board of arbitration, two members of which are to be selected by the employer and the injured employee, respectively, and the third is to be a member of the State Accident Board. From the decision of that board an appeal is allowed to the courts on all questions except the amount of compensation.

Voluntary mutual insurance schemes, in lieu of the legal liability for compensation, are permitted upon conditions, provided that they be approved by the Accident Board and be not obligatory upon employees.

Washington

The bill recommended by the Washington Commission on Industrial Accidents and Employees' Compensation is what is known as a "compulsory insurance law," and is essentially different in method from the preceding.

It applies only to employment in "extra-hazardous works" (which are enumerated and defined to include practically all machino-facture, mining, quarrying, lumbering, transportation, engineering and electrical work, besides many specific occupations, and to which are to be added, by administrative determination, such other occupations as may prove in fact to be extra-hazardous) or where the employer elects to come under the law; to all classes of employees; and to all injuries received unless due to the deliberate intention of the injured.

Every employer to whom the proposed act applies is to pay annually to the State a fixed percentage of his annual payroll (varying from 0.015 in some industries to 0.1 in others), no part of which he may deduct from wages, for an Accident Fund; and four cents a working day for each employee, two cents of which he may deduct from wages, for a First Aid Fund; and upon paying such premiums he is to be relieved from all further liability, except for intentional wrong or for violation of safety regulations—for which latter he is liable to the State substantially in damages for the accidents caused thereby. Default in paying the required premiums subjects an employer to double liability—both for "damages" and for "compensation."

Out of the First Aid Fund injured workmen are to be paid compensation of $5 per week for not to exceed three weeks; and employers are to be reimbursed for the expenses of necessary medical and surgical care, which they are obligated to provide immediately after accidents. Out of the Accident Fund compensation is payable as follows:

In case of death: Funeral expenses not to exceed $75, and to dependents, if any, monthly payments varying from $10 to $35, depending upon the number and degree of relationship and dependence of the dependents, with appropriate limitations as to duration, but under some circumstances to continue for life.

In case of disablement: Monthly payments, beginning from the end of the third week, of varying sums, depending upon the degree of disablement and the number of dependents, but of not more than $35 in any case and of not less than $20 in case of complete disablement, such payments to continue during disablement or for life;—except that for permanent partial disablement the payment is to be a lump sum, "equal to the extent of the injury" but not more than $1500. Certain specified injuries (loss of limbs, loss of sight, paralysis, &c.) are always to be deemed to constitute permanent complete disablement, and certain others, permanent partial disablement. Payments may be commuted for a lump sum, upon the request of the beneficiary.

A State Industrial Insurance Department is created to administer the funds. The Accident Fund is intended to be exactly self-supporting, and provision is made for segregating special funds to meet liabilities as they are incurred and for the repayment of surplus premiums and for assessing further premiums to make good deficiencies. If the fund is insufficient to meet a liability the employer must pay it, but a right is given him to reimbursement from the State. If any establishment, on account of poor or careless management, is unduly dangerous in comparison with other like establishments, the department may raise its premium rates. From the decision of the department in any matter affecting premiums, compensation, &c., an appeal lies to the courts.

It is the idea of the bill that the proposed department shall exercise wide discretion, and that the Legislature shall frequently amend the rates of premiums prescribed in and other minor provisions of the proposed act, as experience may dictate to be proper to carry out its purpose.

Ohio

The report of the Ohio Commission on Employers' Liability recommends a bill which applies to all employments under the State or any of its counties, towns, school districts, &c., in any establishment wherein five or more persons are regularly employed or for any employer who complies with the provision of the proposed act; to all employees in such employments; and to all accidental injuries and deaths, not self-inflicted, from accidents arising in the course of the employment.

It is a "compulsory insurance" law, with provisions for voluntary election by those employers upon whom it is not made compulsory. It requires every employer to whom it applies to pay into the State Insurance Fund annual premiums based on his payrolls according to rates of risks to be fixed annually by the State actuary. The employer may deduct one-quarter of those premiums from wages. Upon making such payments the employer is relieved from all other liability. If an employer, who is obligated under the bill to make such payments, fails to do so, he is made liable for damages both to the State and to the injured employee, under the law of negligence amended by the abolition of the defenses of "contributory negligence," "assumption of risks" and "fellow servant." The compensation, payable out of the Insurance Fund, is as follows:

In all cases: Necessary medical and hospital services and medicines not to exceed $150 in cost.

In case of death within one year after the injury: Funeral expenses, and: If there are dependents residing in the United States, monthly payments of 60 per cent. of wages, for 300 weeks from the date of the injury, but not to amount to more than $3400 or less than $1500. Husband, wife, children, father, mother, sisters and brothers only are to be classed as dependents. Dependents residing outside the United States are to be entitled to one-half the above compensation.

In case of disablement: Nothing for the first week. Thereafter monthly payments beginning at the end of the first week as follows: If it is complete but only temporary, of 60 per cent. of wages, continuing during total disablement, but not longer than 300 weeks, nor to amount to more than $3400 or less than $1500. If it is complete and permanent, such payments to continue for life. If it is only partial, payments of 60 per cent. of impairment of earnings, but not more than $12 nor less than $5 per week, to continue during disablement, but not longer than 300 weeks.

Periodical payments may be commuted for lump sum payments by the State Board of Compensation Awards.

A State Insurance Fund is established and a State actuary and a State Board of Compensation Awards are created; the latter board to consist of five members, with power to appoint an examining physician to represent it in each county. That board is charged with the disbursement of the Insurance Fund and the determination of all claims for compensation. From its determination on certain questions an appeal lies to the courts.

In addition to the provisions hereinbefore summarized, all the measures reviewed provide for prompt notice to the employer of an accident and of a claim for compensation, and for medical examinations of injured employees, at reasonable intervals, by the employers' (in Washington and Ohio the State's) physicians. They also all provide for the modification of the rate or the discontinuance of compensation when the conditions upon which compensation depends vary or cease to exist.

The Bethlehem Steel Corporation in 1910

The report of the Bethlehem Steel Corporation for the year ending December 31, 1910, makes the following financial statement, which is compared with that for 1909:

	1910.	1909.
Net manufacturing profit	$4,216,160	$2,654,457
Other income	127,702	182,136
Total income	$4,343,862	$2,836,593
Deductions:		
Interest on notes and advances	$185,294	$149,518
Interest on funded debt	1,486,956	1,386,263
Depreciation	670,000	500,000
Total deductions	$2,342,250	$2,035,781
Net income for year	*$2,001,612	$800,812
Previous surplus	3,268,076	2,467,264
Total surplus	$5,269,688	$3,268,076

* Equal to 7 per cent. earned on $14,908,000 preferred stock and in addition 6.45 per cent. on $14,862,000 common stock, compared with 5.37 per cent. earned on $14,908,000 preferred stock in 1909.

The balance sheet of the Bethlehem Steel Corporation as of December 31, 1910, compares as follows with that of December 31, 1909:

Assets.	1910.	1909.
Property account	$54,805,936	$48,946,018
Funds with trustees	281,868	4,951,495
Inventories	7,598,386	6,522,378
Notes and accounts receivable	4,954,647	5,150,452
Miscellaneous investments	20,950	103,878
Cash	3,298,807	1,304,193
Deferred charges	1,799,202	1,909,953
Totals	$72,259,796	$68,888,368
Liabilities.		
Preferred stock	$14,908,000	$14,908,000
Common stock	14,862,000	14,862,000
Funded debt	25,993,000	26,660,000
Union Iron Works	1,365,533	1,410,267
Notes and accounts payable	7,773,864	6,327,987
Bond interest	472,182	471,037
Reserved for depreciation, &c.	1,260,163	727,727
Reserved for relining furnaces, &c.	355,365	253,275
Surplus	5,269,688	3,268,075
Totals	$72,259,796	$68,888,368

President Schwab's Statement

From the statement to stockholders by President C. M. Schwab, the following is taken:

A comparative statement of the total estimated amount of the orders booked by the corporation for the past three years and the uncompleted orders on the books at the close of these years, shows as follows:

	Orders booked during year.	Uncompleted orders on hand December 31.
Year ended December 31, 1908	$14,458,997	$7,592,502
Year ended December 31, 1909	28,696,516	14,073,834
Year ended Decembtr 31, 1910	29,580,562	17,370,660

Notwithstanding the fact that the general market conditions in the iron and steel trade for the year were most unsatisfactory, the figures above reported show a steady advance in earnings, orders booked and unfilled orders on hand. The diversity of the products manufactured by your corporation is undoubtedly an element that makes for stability in earnings. Its output consists of tonnage products, such as pig iron, blooms, structural shapes and rails; more highly finished commercial products, such as machined forgings, large special machine tools, gas engines and the like; and armor and ordnance material for our own and foreign governments. In a period of depression the business in tonnage products is the first to fall off, while contracts for finished forgings, engines, special machinery, &c., require in some cases many months for completion, and work consequently continues during the earlier stages of a depression on contracts previously placed. Further, it is only rarely that a falling off in requirements of our own and foreign governments for armor and ordnance is coincident with an unfavorable commercial market. As a result of this condition, the plants of your corporation have during this year been running at a better proportion of their capacity than most of the other mills of the country.

Even the rails and structural shapes produced at Bethlehem are in the nature of a specialty, in that the rails are rolled of open hearth steel and the structural shapes are of a patented, special, economical section not produced elsewhere in the United States, so that in dull times we receive a most satisfactory share of such contracts as are placed. This is evidenced by the fact that during the year 1910 our rail and structural mills have been operated to the fullest extent of their steel-making capacity. The production of steel for these mills has been the factor which heretofore has limited their output, but this will be at least doubled by the new Bessemer plant now in operation.

The additions and improvements to the Bethlehem plant for the purpose of increasing its steel making capacity, referred to in the last report, have been practically completed. One of the blast furnaces was blown in April 10, 1910, the second in March, 1911. This plant will then have four large, modern blast furnaces and two smaller ones, with a productive capacity of about 750,000 tons of pig iron per annum, sufficient to supply its entire Bessemer and open hearth requirements.

The increase in steel making capacity necessary to supply the full demands of the rolling mills has been provided by the addition of a Bessemer plant, which was put into operation February 8, 1911. With the completion of the blast furnaces this now gives a capacity of about 600,000 tons of rolled material per annum and places the Bethlehem plant in a position to realize the maximum return from the investment in the extension known as the Saucon plant. A great economy still remains to be effected by the electrification of our smaller mills to be driven by current produced by the utilization, in gas engines, of the waste gases from the blast furnaces, and this will be proceeded with as soon as deemed expedient.

The Bethlehem plant has grown to such magnitude that a further extension of its railroad facilities is deemed advisable, and a charter has therefore been taken out for a railroad, to be known as the Philadelphia, Bethlehem & New England Railroad. Survey of the main line has been made and construction plans begun, with the ultimate purpose of providing connections with other trunk lines than those which at present reach the plant. The plan for financing this road contemplates only a moderate direct investment by your corporation.

The number of employees in your various plants in the United States, and the salaries and wages paid therein, compared with last year, are as follows, exclusive of Cuban mines:

	Average number employees during year.	Salaries and wages paid.
1909	8,783	$6,678,790
1910	11,034	8,211,838

In view of the large expenditures necessary to extend the business, it is stated that it has been thought unwise to distribute any of the earnings. The increasing business has required that a large part of the net earnings be used for working capital. The last dividends paid were a total of $111,810 on the preferred stock in 1907.

The Midvale Steel Company's Report

The report of earnings of the Midvale Steel Company, Philadelphia, for the fiscal year ending October 31, 1910, is as follows, with comparison with the preceding year:

	1909-10.	1908-09.
Profits over all costs, charges and expenses, including depreciation	$1,411,181	$555,347
Deduct dividends	*367,500	150,000
Fire insurance fund	100,000	.....
Balance, surplus for year	$943,681	$405,347

* As to 1200 per cent stock dividend see below.

The balance sheets of October 31, 1910, and October 31, 1909, compare as below:

Assets.	1910.	1909.
Property and equipment	$10,488,534	$9,621,875
Patterns	200,000	200,000
Worked materials	1,551,825	1,983,072
Raw material	822,474	527,910
Merchandise, coal, &c.	444,115	369,398
Bills and accounts receivable	1,151,278	1,101,009
Investments in bonds	200,000	100,000
Cash	383,893	109,412
Totals	$15,242,119	$14,012,178
Liabilities.		
Capital stock	$9,750,000	$750,000
Bills payable	1,250,000	1,125,000
Accounts payable	432,626	371,202
Miscellaneous	4,372	164
Fire insurance fund	200,000	100,000
Surplus	†3,605,120	11,665,812
Totals	$15,242,119	$14,012,178

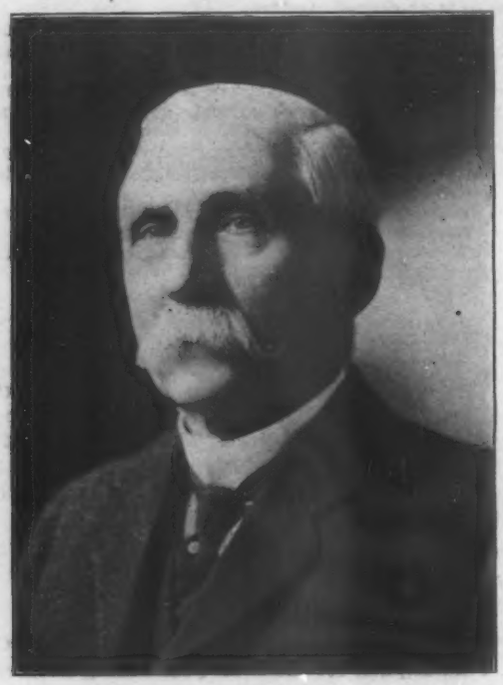
† After deducting stock dividend of 1200 per cent. paid to stockholders of record February 23, 1910, calling for $9,000,000.

The National Tube Company, Pittsburgh, Pa., is making some improvements and additions to its plant at Lorain, Ohio, consisting of one six-hole soaking pit furnace for No. 1 blooming mill, new crane runway spans and an extension to the south end of the building, the total cost of all the work being about $58,300.

Obituary

ANDREW S. UPSON

Andrew Seth Upson, president of the Upson Nut Company and the Union Rolling Mill Company, Cleveland, Ohio, died suddenly April 2, being stricken with heart failure while reading at home. He was 75 years of age, having been born in Burlington, Conn., in 1835. At the age of 18 he secured a horse and wagon and made his first start in business by selling bolts and nuts in his native State, securing his stock from his brother-in-law, Dwight Langdon, a manufacturer in Unionville, Conn. He was so successful that two years later he was employed by the Langdon Company as a regular salesman. In 1860 Mr. Langdon died, and Mr. Upson organized a partnership, and continued the business under the firm



ANDREW S. UPSON.

name of Upson & Dunham. This was succeeded by the Union Nut Company, the name of which in 1866 was changed to the Upson Nut Company. In 1872 a branch was established in Cleveland, which later became the main plant of the company.

Mr. Upson had made Cleveland his permanent home since 1889. He retained the active management of the Upson Nut Company until his death. In the past few years he had traveled extensively, but while at home he continued to attend closely to business. In addition to manufacturing nuts and bolts, the company operates a blast furnace, and has about completed the erection of a new open hearth steel plant in Cleveland, of which the blooming mill and one open hearth furnace it is planned to place in operation this month. The taking up of the additional burden of building a steel plant, in connection with his other responsibilities at his advanced age, caused considerable comment among Mr. Upson's associates and showed that his energy was not impaired by years. He was in other ways prominently identified with business affairs in Cleveland, being vice-president of the State Banking & Trust Company and a director of other Cleveland banks and other corporations. He was a member of the Cleveland Chamber of Commerce and the Union, Colonial and Euclid clubs in that city. He leaves two sons, Dennis A. and William J. Upson, and one daughter, Mrs. F. H. Rose, wife of the assistant treasurer of the Upson Nut Company.

MORTIMER H. BICKLEY, president of the Penn Steel Casting Company, Chester, Pa., died April 1, aged 80 years. He was one of the founders of the company and has been its president since 1892. He was also prominently identified with other Chester industrial interests. He leaves a widow, a daughter and two sons.

E. W. VANDUZEN, president and treasurer of the E. W. Vanduzen Company, one of the oldest foundrymen in the Central West, died at his home in Cincinnati, March 30, aged 86 years. He leaves two sons and four daughters. It is announced that the foundry business will continue to be conducted under the same name.

GEORGE A. BARNES, secretary of the Whitman & Barnes Mfg. Co., Akron, Ohio, died March 22, aged 54 years. He was born in Cincinnati and began his long service with the company at its Syracuse factory in 1876. In 1879 he was transferred to the Canton, Ohio, plant, remaining there as manager until 1895, when he removed to Akron, at which place he resided until his death, with the exception of the years 1902 and 1904, when he was located at the Chicago offices of the company. At the time of his death, in addition to being secretary, he was a director and a member of the Executive Board. He leaves a widow and one son, H. L. Barnes, who is superintendent of the company's Chicago works.

OWEN LEIBERT, Bethlehem, Pa., died March 25, aged 75 years. He was connected with the Bethlehem Steel Works for nearly 40 years, and was chief engineer when he retired from active work nearly 19 years ago.

THOMAS RICKARD, vice-president of Harron, Rickard & McCone, San Francisco, Cal., agents for the Niles-Bement-Pond Company and other machinery lines, died March 25, at his home in Berkeley, Cal., from heart failure. He was a young man in apparently good health.

THOMAS M. GALVIN, vice-president of the Eby Machinery Company, San Francisco, Cal., died March 25, at St. Mary's Hospital in that City, after an illness of three weeks, aged 48 years. He was a native of Michigan, and had been in the machinery business in San Francisco since 1884.

JONAS COE HEARTT TUPPER, New York, who had been engaged in the foundry business for 50 years, died April 1, aged 73 years. He was born at Troy, N. Y. He was a son of Capt. W. W. Tupper, who had charge of one of the first passenger packets operated on the Hudson River. For 63 years he had lived in New York, conducting business under the firm name of W. W. Tupper & Co. He leaves a widow and one son, W. F. H. Tupper.

The Gandy Belting Company, 726-740 West Pratt street, Baltimore, Md., has adopted the new uniform belting price-list, effective March 1, and has issued a circular giving the full list of prices which now apply on the Gandy belt. The circular indicates the sizes carried in stock, which range in all widths and plies from 1-in., four-ply, to 30-in., 10-ply. It also gives a telegraphic code. The very comprehensive stock carried enables the company to fill orders on the day received with thoroughly seasoned belting. Besides the stock at Baltimore the company has its distributers scattered throughout the country.

The United States Geological Survey, Washington, D. C., has issued its large table giving the production and value of the mineral products of the United States for the calendar years 1900 to 1909. The value of the production of metals in 1909 is placed at $753,427,290; nonmetals, $1,132,197,897, and unspecified, $300,000; total, $1,885,925,187, against a total of $1,595,048,849 in 1908. The maximum value was reached in 1907, when it was placed at $2,071,607,964.

The boring of the 9¼-mile tunnel through the Alps, under the Loetschberg, in the canton of Oberland, Switzerland, which will shorten the railroad journey from Italy to London from two to three hours when all the work has been completed in 1913, was finished March 31. The French contractors who undertook the work have been engaged in it four years and a half.

The stockholders of the Nova Scotia Steel & Coal Company on March 29 authorized an increase in the common stock from $6,000,000 to $7,500,000. None of the new stock will be issued at present.

Magnetic Switch Motor Starters

A New Type Developed by the Electric Controller & Mfg. Company

A magnetic switch motor starter for accelerating electric motors automatically cuts out the starting resistance step by step through the operation of magnetically operated switches. While it is more complicated and expensive than a hand operated starter, it is widely used in connection with large motors and for automatic control because of its advantages, not the least of which is the thorough protection afforded to the motor and to the driven machinery. The Electric Controller & Mfg. Company, Cleveland, Ohio, has developed a commercial magnetic switch, known as the type A, that is said to be radically new in principle, theory and operation. The operating coil of this switch is composed of a few turns of heavy wire covered with fireproof insulation and is connected in series with the motor. One of the special features of this starter is that it will close its contacts only when the current flowing through it is below a certain predetermined amount, thus combining in one a magnet switch and a current limiting relay. As long

Fig. 1.—A Single Magnetic Switch Motor Starter Made by the Electric Controller & Mfg. Company, Cleveland, Ohio.

as the current flowing through this switch exceeds this predetermined value, the switch will not close until the current has been reduced by increasing the speed of the motor. Fig. 1 gives front and side views of one of these switches, while a three-unit type with a knife switch is illustrated in Fig. 2. For automatic control the starter is equipped with a magnetic switch, as shown in Fig. 3.

A cylindrical iron shell mounted on a slate panel incloses and protects the operating coil, as shown in Fig. 1. The two laminated copper brushes at the top of the switch are short circuited when it operates and cut out a section of resistance. A plug at the bottom of the coil shell can be screwed out or in to adjust the amount by which the current must fall before the switch operates.

These switches are well adapted for use as motor starters and the maker has standardized them for 110, 220 and 500 volts direct current and a wide range of different horsepowers. Six different types of starter can be supplied, with various numbers of accelerating switches. In their simplest form these switches consist of a number of type A switches, mounted in connection with a resistance. These can be used in connection with a knife switch, either on the panel, as shown in Fig. 2, or mounted at some distance from it. A shunt-wound magnetically operated switch is provided, where the starter is to be used for push button or automatic control and also for the knife switch control of large motors. If desired a starter of this type, which is shown in Fig. 3, can also be equipped with an overload, which gives all the features of a circuit breaker.

A complete line of accessories has been developed for maintaining the water level in tanks and regulating the

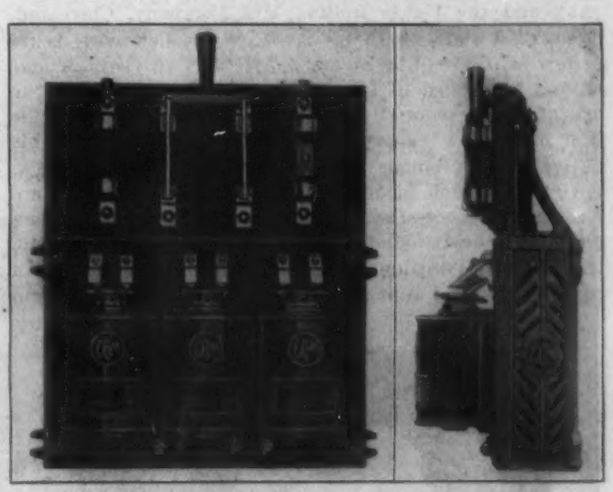


Fig. 2.—Front and Side Elevations of a Three-Unit Starter with Knife Switch on Panel.

pressure in compressed air systems automatically. The number of points of acceleration developed by any particular starter is one more than the number of switches used. One or at most two switches will be sufficient for small motors where a light load has to be accelerated, but for large motors and especially those having large inertia the use of five or six switches is recommended. No-voltage protection is afforded by all forms of these starters as if the supply of electricity is interrupted the switches drop out, thus inserting all of the starting resistance in series with the motor, and when the current begins to flow through the circuit again the motor is accelerated automatically as if it were being started for the first time.

In operation it is simply necessary to close the knife switch or push a button to start the motor, while opening the switch stops it. The motor will be accelerated automatically and brought up to speed in the shortest possible time consistent with safety. The amount of time required depends upon the character of the load; if the load is light the switches will close rapidly and bring the motor up to full speed in a short space of time, while if

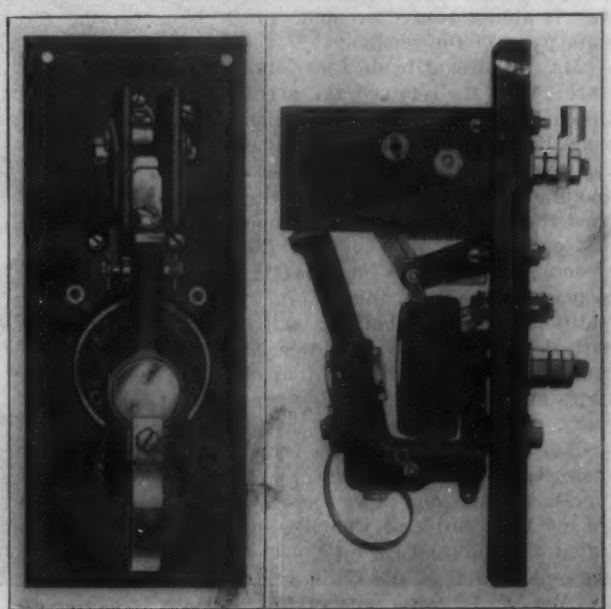


Fig. 3.—The Starter Equipped with a Type S Magnetic Switch for Automatic Control.

the load to be accelerated is large, such as a punch press having a large flywheel, the switches will close more slowly, and the time required to bring the motor up to full speed will be proportionately lengthened.

The Westinghouse Apprenticeship System

How These Companies Train College Graduates for Their Engineering Departments

The value to a college graduate of an apprenticeship course as a supplement to his college work can hardly be overestimated. When a young man leaves college his mind is alert and impressionable, and he adapts himself readily to the conditions that prevail in a large manufacturing institution. His senses are keen, and by changing, at short intervals, from one department to another of a large works he is able to familiarize himself quickly with the underlying principles of manufacturing methods. The knowledge and training in methods of practice that he gets during his service in the apprenticeship course make him far better qualified to enter pure engineering, sales engineering or executive work.

The importance of an apprenticeship system to the development of a highly organized engineering department was recognized by the Westinghouse Electric & Mfg. Company very shortly after the establishment of its works at East Pittsburgh, Pa. The apprenticeship course was regularly organized there in 1896, and at first was established to keep track of the young men who presented no specific qualifications along electrical lines and who entered the organization with only the assurance that as

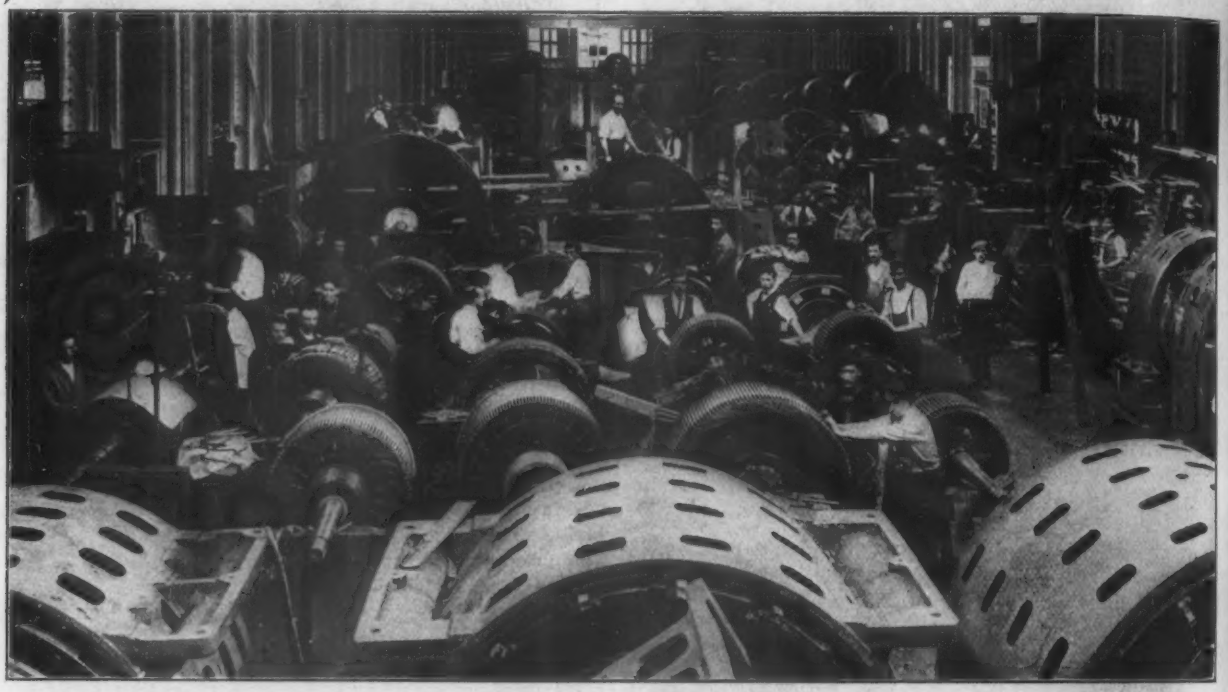


Fig. 1.—The Engineering Apprentices at Work in the Assembling Shop of the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa.

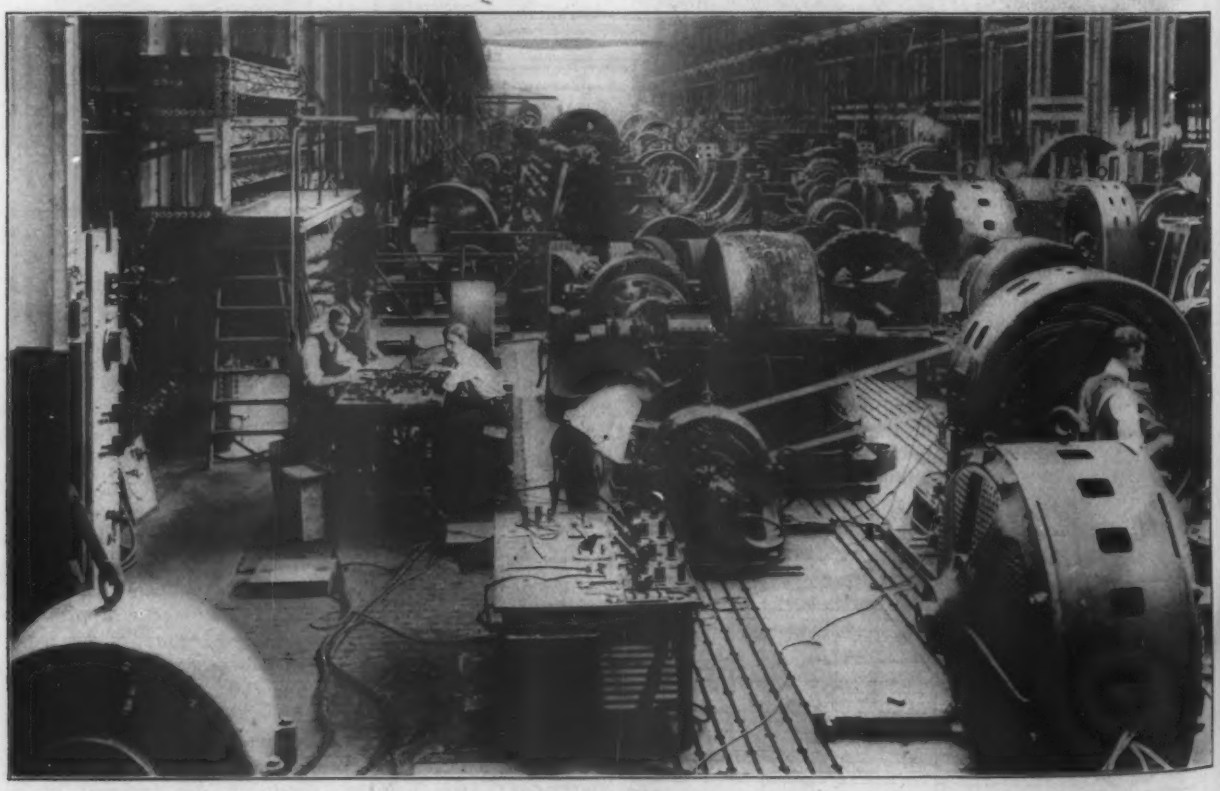


Fig. 2.—Testing the Completed Machines.

Fig. 3.—An Interior View at the Westinghouse Club, Wilkinsburg, Pa.

opportunities afforded they would be advanced. Technical graduates and others were treated alike as far as the course of shop training was concerned. This arrangement was, of course, rather desultory in its applications and was unsatisfactory to the company and to the men.

In 1902, as the works had grown rapidly and the apprentices had increased, it was decided to put the apprenticeship course on a more systematic basis. It is now known as the engineering apprenticeship course, and admits graduates of technical schools and universities. This course is of two years duration, or 5480 hours, 18 cents per hour being paid the first year, 20 cents for the next six months and 22 cents for the remainder of the second year. The man is put on trial for 685 hours before he is admitted fully to the course. Application for admittance into the engineering apprenticeship course must be made by letter in the handwriting of the applicant, and he must state date of birth, course pursued, degrees received, refer to professors or others, give a statement of any practical experience which he may have had, and the name and address of father, or mother if father is deceased, or guardian in case both parents are deceased. A recent photograph of the applicant must accompany his application.

The apprentice is given an opportunity of becoming familiar with the manufacturing operations and the general construction and working of the apparatus produced. He is afforded, in the various departments of the works, as shown in Figs. 1 and 2, actual shop and engineering experience to supplement the work he has done in college. At times apprentices are taken from the course to fill regular positions in the company's engineering or sales organization before the expiration of the full apprenticeship service; in this case the compensation is increased in accordance with the position that the apprentice has been called upon to fill.

The apprentice devotes somewhat over one-half of his time to the shops and the rest of the time to the engineering, construction, testing and correspondence departments. The large scope of the work in which he is permitted to engage gives him an excellent opportunity

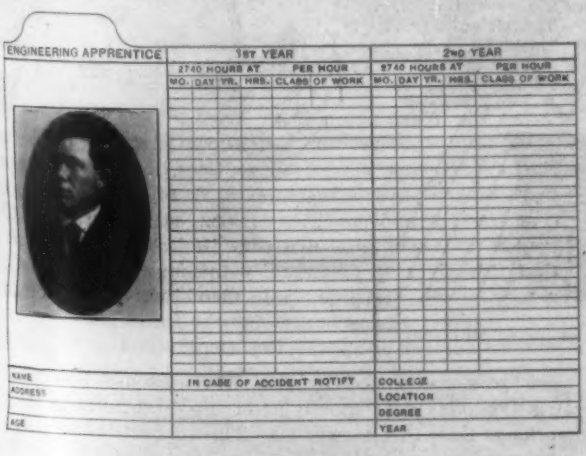


Fig. 4.—Front View of the Card on Which the Work of Each Apprentice Is Recorded.

to become familiar with up-to-date engineering practice and to decide what branch of the work he would prefer to pursue. The time is divided between the different departments, depending upon the relative values of the experience to be gained in these departments. The testing department, illustrated in Fig. 2, comes last, since it is desired that the apprentice should have a thorough understanding of the apparatus and its parts before he is permitted to operate it.

The engineering apprentices can avail themselves of the advantages of the Westinghouse Club, an interior view of which is given in Fig. 3. This club effects among its members a spirit that is closely akin to the feeling that exists among the undergraduates of a college. The club affords its members an opportunity of becoming acquainted with other young men whom he should know in his future career, as well as older and more experienced men in his field of work. The club provides for educational, social and athletic activity among its members. It is governed by a board of thirteen directors, chosen, for the most part, from the younger men, who are thus responsible for the direction and success of the club. Incidentally an important advantage of club membership to these younger men is the experience gained in conducting such an organization. The various activities supported by the club are as follows: Athletics, including baseball, basketball, tennis, &c.; entertainments, such as dancing, smokers, &c.; excursions to notable industrial plants and other points of interest around the famous Pittsburgh district; music, such as a band, glee and mandolin clubs, &c. The predominant feature of the club is the educational work. Sections of technical or engineer-

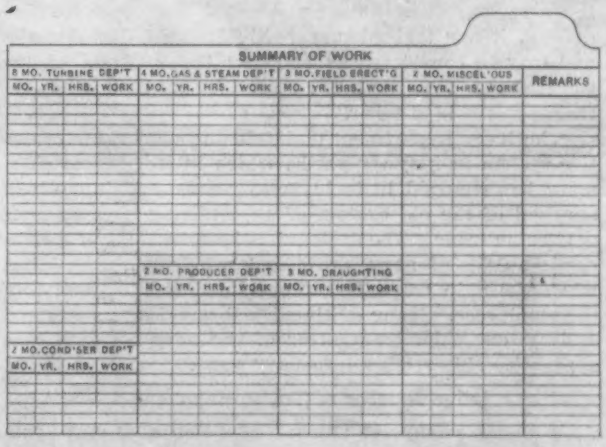


Fig. 5.—Back of the Apprentice's Record Card.

ing classes are organized to deal with the application and construction of various types of apparatus or to consider other subjects of importance in industrial organization and management. These classes supplement the daily engineering work of the apprentice in the factory.

The Machine Company's System

The apprenticeship courses at the Westinghouse Machine Company are conducted along the same general lines and the requirements for admission are practically the same. There are at present 35 graduates taking the course with the machine company. These men hail from universities and colleges all over the country.

The record that is kept of each engineering apprentice is shown in Figs 4 and 5. A detailed account of the work the apprentice has done in each department is summarized on the back of the card, Fig. 5. The two years' course for the engineering apprentices is divided as follows: Eight months, turbine department; two months, condenser department; four months, gas and steam department; two months, producer department; three months, field erecting; three months, drafting, and two months, miscellaneous work.

The wages paid are the same in both companies and give an average monthly pay of $40 to $45 the first year and from $45 to $55 the second year. An apprentice's expenses average about $35 a month, the most important items of which are about $10 per month for

room rent, about $4 a week for board, and railroad fare about $3.50 a month. Although the remuneration does not provide for the indulgence of any of the expensive habits that the apprentice may have formed during his college career, still it is ample to provide him with all the essentials and to keep him well fed.

With few exceptions all of the men who graduate in the machine company's course are taken into the company's sales or engineering organizations. Some of these exceptions are men who are sent by the company's customers to take the course. Sometimes a company that is operating a great many Westinghouse machines desires to have some man in its organization familiarize himself thoroughly with their design and operation by taking the apprenticeship course.

The apprentices with the machine company also are eligible to membership in the Westinghouse Club. This affords them social, physical and educational advantages. They are able to mix with men engaged in other lines of work and thus broaden their scope.

Navy Yard Apprentices

The System in Vogue in U. S. Navy Yards

BY HENRY WILLIAMS, NAVAL CONSTRUCTOR.

Any discussion of the general question of training mechanics and of apprentice systems is incomplete without a description of the system of training apprentices to the skilled trades in navy yards. While the system there in vogue has many undoubted shortcomings and defects, it has trained many highly skilled mechanics and may be considered as showing the attitude of the Government toward the apprentice question and the training of skilled labor.

The Navy Department maintains an elaborate apprentice system in its navy yards, which in its general character has changed little in many years, and is a direct survival of the old custom of apprenticing boys to some particular trade. The system has been in vogue since the earliest days of navy yards and wooden ship building, when the ship carpenters represented the majority of the employees. Many distinguished naval architects and at least one chief constructor of the navy began life as apprentice shipwrights in a navy yard.

Large Number of Trades Represented

With the change of steam propulsion and steel construction, the number of trades represented increased greatly. The apprentice system was extended to include them all, so that at the present time in a yard such as the Brooklyn Navy Yard there are no less than 16 trades in which apprentices are employed. They are paid liberally, and have an excellent chance of learning their trades under most favorable conditions. Furthermore, when they have passed out of their apprenticeship they are rated journeymen mechanics if qualified and if efficient are assured of fairly steady employment and an excellent chance to become leadingman and ultimately foreman. Having this in mind, it is not difficult to understand that the places are greatly desired, and, when examinations to fill the vavancies are held, a large number of desirable boys present themselves to compete.

The regulations governing the employment of these apprentices require the registration of applicants with the Board of Labor Employment at the navy yard in which they wish employment, designating the specific trade desired. certificates of character and habits of industry must be furnished, and applicants must be between 15 and 18 years of age. Competitive examinations to fill vacancies are held every six months, and a number of names equal to four times the number of vacancies in each trade is taken from those highest on the register.

Applicants Are Examined

The examining board consists of three or more naval officers, one of whom must be a naval constructor and one a surgeon. The candidates are examined as to their physique and each is assigned a mark. Those not found to possess the required physical qualifications are not examined further. The mental examination consists of a written examination in spelling, simple arithmetic, including decimals and the rule of three, and an oral examination to determine fitness for trade, general intelligence, &c.

The applicants are given appointments in the order of standing, as determined by the examinations, and those who pass a satisfactory examination, but for whom there are no vacancies, constitute an eligible list for future vacancies in the succeeding six months. Those who fail to pass are dropped from the register and cannot re-register for one year.

Apprentices are assigned to employment under the various foremen and mechanics, and learn their trade in the good old-fashioned way by seeing the work and helping with it, and later by being given work within their capabilities to perform. They are marked quarterly by their foremen as to their progress and general conduct. It is contemplated, as a part of the training of apprentices, to give them each day an hour or two of instruction in elementary school subjects. Due to press of work, however, this has not been done at all of the navy yards, the boys being encouraged to attend night schools or take correspondence courses to supply the deficiencies in their general education.

Semiannually, all apprentices are examined by the board of officers referred to above, and the quarterly reports of foremen are considered in connection with the results of the examination. This board determines and recommends as to the fitness of apprentices for advancement or for promotion to fourth class mechanic. If satisfactory improvement has not been shown, or if the conduct has not been good, the board recommends such disciplinary action as may be desirable, or the discharge of the apprentice.

Classification of Apprentices

Apprentices are classified under four classes: fourth class apprentices receive 20 per cent., third class 30 per cent., second class 40 per cent. and first class 50 per cent. of the pay of a first class journeyman workman of the trade at the yard in which he serves. Before being eligible for promotion, apprentices must serve at least six months in each of the fourth and third class and one year in each of the second and first class. When an apprentice has served three years and is 20 years of age, he is eligible for promotion to the lowest rating in the trade in which he works. He must serve one year in this grade, and at the end of this time, if his services have proved satisfactory, he receives a certificate of apprenticeship signed by various officials. Ex-apprentices are continued in employment rated in accordance with their merits and placed on the same footing as other mechanics employed.

In order that the importance of the apprentice system in navy yards and its contribution to the skilled labor market may be realized, the following list is given, showing the number of apprentices in each trade at the Brooklyn Navy Yard:

Boatbuilder	1	Patternmaker	3
Boilermaker	2	Plumber	16
Coppersmith	2	Sheet metal worker	11
Die sinker	1	Shipfitter	18
Electrician	15	Ship joiner	9
Machinist	18	Shipsmith	2
Molder	2	Shipwright	5
Painter	1	Wire worker	5

At the Washington Navy Yard, where is located the naval gun factory, the machinist trade is practically the only one employing apprentices, but, as the main work of the yard is machine work of the very highest class and the opportunities for employment in mechanical trades in Washington are very limited, it will be seen that this gives an opportunity to many boys of learning a most excellent trade while providing the navy yard with a supply of mechanics for the future.

The number of apprentices employed is as follows:

Blacksmiths	6	Machinists	250
Coppersmiths	3	Molders	12
Joiners	7	Patternmakers	5

The boys applying to take the examinations are of surprisingly high class, many of them often earning more money than they could expect for some years, in their new positions.

Office boys, errand boys, news boys and the like abandon readily their comparatively lucrative employment for a chance to learn a trade in the navy yard. The reasons given by many of them for doing so are extremely original. One bright youngster "didn't want to be a street car conductor all his life"; another one said his father was afraid he would learn bad habits as office boy in a broker's office. Many of them are attracted by the prospect of working on "Uncle Sam's warships."

There appears to be every reason to suppose that navy yard apprentices will be found as a general rule to be highly skilled workmen in their trades, and that the system as a whole, while having numerous shortcomings, undoubtedly is an important factor in training mechanics and in recruiting for the mechanical trades many boys for whom the ordinary shop has no attraction and who would, under other circumstances, become clerks or street car conductors.

It should be remarked that the above is limited to the apprentices at navy yards and does not apply in any way to the question of training the enlisted force on naval vessels, which also contributes largely, but in a different manner, to the skilled labor market.

Pennsylvania Railroad Apprentices

Unique among railroad schools in America is one for apprentices which has been established at Altoona, Pa., by the Pennsylvania Railroad, co-operating with the Engineering School of the Pennsylvania State College. This school is for the benefit of regular apprentices in the railroad shops at Altoona. The object of the school is to give to apprentices a knowledge of the fundamentals of mathematics, mechanics and drawing, thereby making them better artisans—men more useful in their specific trades. The large attendance shows that the apprentices are eager to make the most of the opportunities open to them, and the company is more than repaid by the actual increase in the efficiency of its workmen, and by the assurance of unswerving loyalty from the men who have received all their training in its service.

Departing from the general practice in institutions of this nature, which is to teach only technical subjects, systematic work in English is carried on with special reference to writing business letters, filling out order blanks, time cards, and other details. The work is arranged to cover three scholastic years of 42 weeks. Each apprentice receives four hours of instruction a week, or a total of 504 hours for the three years. The subjects given include essential elements of many of those in the mechanical engineering course of the best universities—mathematics, physics, mechanical drawing, mechanics, mechanism, strength of materials, machine design, experimental tests and shop management. A monthly report of grades is made out by the head instructor and submitted to the general office of the company and to the Pennsylvania State College. These monthly reports, with the annual reports concerning each member of the classes, when taken in connection with the regular records of the shop foremen, form an accurate basis on which to select and use the men to the best advantage.

Deere & Co.'s Reorganization

Deere & Co., Moline, Ill., implement manufacturers, have been reorganized and reincorporated under a 99-year charter, with an authorized capital stock of $50,000,000. The company hereafter will embrace the various Deere factories and branch houses, which up to this time have been separately incorporated, but owned or controlled by Deere & Co. Nineteen subsidiary companies are represented in the merger, in addition to which the reorganized company has acquired the Dain Mfg. Company, Ottumwa, Iowa, and Welland, Ont., and certain interests in the Marseilles Company, whose plant recently was removed from Marseilles, Ill., to East Moline, Ill. As all the stock in the 19 subsidiary companies was owned by the stockholders of Deere & Co., the change represents a merger only as far as the Dain and Marseilles companies are concerned.

The new corporation embraces the following factories: Deere & Co., Moline, Ill.; Deere & Mansur Company, Moline, Ill.; Moline Wagon Company, Moline, Ill.; Marseilles Company, East Moline, Ill.; Kemp & Burpee Company, Syracuse, N. Y.; Fort Smith Wagon Company, Fort Smith, Ark.; Dain Mfg. Company, Ottumwa, Iowa, and Welland, Ont. It also includes the 13 branch houses of the John Deere Plow Company located at Kansas City, Mo.; St. Louis, Mo.; Indianapolis, Ind.; Dallas, Texas; New Orleans, La.; Omaha, Neb.; Portland, Ore.; Spokane, Wash.; Denver, Colo.; Oklahoma City, Okla.; Baltimore, Md.; Winnipeg, Man.; San Francisco, Cal.; Syracuse, N. Y., and the branch house of the Deere & Webber Company, Minneapolis, Minn.

Stockholders in each of the 22 concerns have surrendered their stock certificates to the First Trust and Savings Bank, Chicago. In return they will receive stock in the new corporation as soon as the new charter is secured. Details of a plan whereby employees of the company will be given an opportunity to acquire stock on favorable terms are under consideration, and an announcement will be made in the near future. A large factory site adjoining the Dain plant in Welland, Ont., has been purchased, on which an extensive addition will probably be erected, to be used for the manufacture of harvesters for the Canadian trade.

Customs Decisions

Barbers' Hair Clippers

The Board of United States General Appraisers has decided that hair clipping instruments used by barbers are not machine tools within the meaning of the tariff act of 1909. The merchandise in controversy was entered by Sears, Roebuck & Co. The custom house authorities classified the articles as manufactures of metal and imposed a duty of 45 per cent. Under the claim made by the importers, the duty would be 30 per cent. General Appraiser Fischer, who writes the decision, says that the articles are not machine tools. The hair clipper is an instrument of manual operation, and would answer in that respect to the definition of a tool. At the same time the board takes the view that the article in no way partakes of the character of power tools, and is not within any of the definitions of the term "machine tools" as given by lexicographers. The importers' claims are accordingly overruled.

Rolls for Rolling Mills

Another claim involving the tariff's paragraph for machine tools was filed by the American Steel & Wire Company. The collector of customs at Cleveland assessed a 45 per cent. duty on cast steel rolls for rolling mills on the ground that the rolls are manufactures of metal. The decision for the board states that, while the articles may be parts of machine tools, they are not entitled to classification under the provision for machine tools. On this point, the decision says: "The cold rolling mills of which these rolls are to form a part would, if imported, be subject to classification at the rate claimed, but the steel rolls considered separately would no more be entitled to such consideration than would the gear wheels if imported alone. The protest is overruled, and the decision of the collector affirmed."

Vegetable Cutters

A decision has been handed down favorable to the claim of Downing, Judae & Co. regarding the classification under the present tariff of vegetable cutters made of tin. The articles are known as parers and corers. They were returned for duty as "kitchen knives," at the rate of 1 cent each and 15 per cent. ad valorem. The importers' claim was that the articles should be allowed to enter at 45 per cent. as manufactures in chief value of metal. The decision holds that as the cutters are used in grating, slicing and peeling vegetables and are made of tin, they are not "knives," within the meaning of the cutlery provisions of the law. The collector's assessment is reversed.

Features of a Modern Steel Foundry

Some Interesting Points of the Bayonne Steel Casting Company's Plant

In the construction of a modern steel foundry many problems are encountered. In the new foundry of the Bayonne Steel Casting Company, Bayonne, N. J., planned by the general manager, A. E. Williamson, the raw materials enter at the back and travel forward continuously until they leave the shipping room as the finished product. Machinery is used wherever possible to avoid the laborious and expensive hand methods.

Handling the Raw Materials

The raw materials, ore, coke, scrap, pig iron, &c., are brought into the foundry yard on a branch track from the railroad and unloaded directly from the cars into their respective storage spaces. Above the latter is an overhead track, carrying a small electric trolley hoist arrangement, so that sheet steel buckets loaded with the raw materials can be picked up, carried into the foundry and dumped on the charging floor, or into a chute which discharges them into the cupola. Fig. 1 shows the railroad track curving around the corner of the foundry, part of the stock yard, the mono rail track and its supports and the trolley hoist lifting a dump bucket.

Beyond the turn the railroad track flanks the foundry building its entire length, leaving enough space for the stockyard with the mono rail above it. The car shown in Fig. 1 has been switched from the main line and is on its way into the foundry building and over the charging floor, through a door hidden by a jog in the building.

To throw the switch the car is run back until the operator can reach and turn a crank handle at A, the car at that time not being on the movable part, E, of the rail. The crank A revolves the rod B, which is supported by the small I-beam C. The rod D is revolved simultaneously with the rod B, through a universal joint connection. On the end of the rod D is a worm meshing with a gear rack fastened to the end of this switch rail.

Fig. 1.—The Mono Rail Tramway and the Car for Handling the Raw Material.

Inexpensive sheet metal buckets are used, and are kept filled at the various material piles, so that the trolley hoist is not delayed for loading.

The foundry building was first erected at Delawanna, N. J., some 25 miles from Bayonne for a steel foundry, and was purchased, dismantled and re-erected by the present owners at Bayonne, and castings were being made in three months and four days.

The Charging Floor

Fig. 2 is a view of the charging floor, with raw materials for a complete cupola charge piled upon it and shows more plainly the trolley hoist. The rail is directly in line with the center of the cupola, and the wooden tray, hanging from the hoist, is open at one end, so that it can be discharged by tilting it until the load slides into a chute (not shown) and thence into the cupola.

Fig. 2.—View of the Charging Floor, Showing the Cupola Being Charged from the Car.

The melted metal is drawn from the cupola spout F, Fig. 3, into large steel plate ladles handled by the overhead traveling crane and poured into the Tropenas converters shown on either side of the cupola. The converters discharge into ladles placed in the pits in front of them. The metal is transferred into smaller ladles and from these to the molds. At the extreme right of Fig. 3 is a small cupola, H, that is used for melting down the alloys. The cupola and the converters are in a corner of the main foundry just back of the columns supporting the roof trusses and the traveling crane track. The ladles of molten metal can thus be easily handled by the overhead cranes and the hot metal is readily accessible for the molders.

Features of the Building

As the main foundry building is constructed with a structural steel frame and corrugated sheet steel roof and siding and only steel flasks are used, the fire hazard is nil. The foundry is of liberal hight, so that smoke, fumes and gases can rise and escape through numerous windows near the roof, keeping the air clear.

At one end of the main building are the sand bins and sand mixing machinery. At the right of Fig. 4 is shown the molding sand crusher or grinding pan I, with the rollers JJ. The machine at the left mixes the sand in any desired combination, either for core making or molding. The sand is shoveled into the hopper of K, where the coarsest foreign substances are removed and is then picked up by the buckets L, and carried to the top where it is dumped on a vibrating screen or riddle and passes through several other operations. It can be mixed with water to give it the proper degree of moisture or with oil to be used where oil sands are desired or with

Fig. 3.—The Cupolas and the Converters from the Foundry Floor.

molasses to give it the proper binding qualities. Behind this machine and occupying this entire corner of the foundry are the large sand bins which are filled directly from railroad cars run in on the siding just outside the building. When the machine has prepared the sand it is put into huge buckets and transferred to the molding floor by the overhead crane.

Jib Cranes

Numerous jib cranes like the one in Fig. 5 are used throughout the foundry. These are detachable and portable and are secured to the building columns by hinges that allow them to be lifted and transferred from one column to another by the overhead traveling crane. A jib crane is provided for every three or four columns, and no more are required than can be kept busy.

Each jib crane has an air hoist mounted on four wheels and traveling on the I-beam forming the radial arm of the crane. This arm swings through a semi-circle and the crane can thus cover a large amount of floor space. In the bay in the background, Fig. 5, the molding machines and the bench molders are located, while to the left, the small floor work is being molded.

Drying Ovens

While the drying ovens are of the ordinary type with roll top doors, the mold cars as shown in Fig. 6 have

Fig. 4.—The Crusher and the Mixer for the Molding and the Core Sand

some points of special interest. The platform of the car is built of I-beams and channel irons, and on the center line are securely fastened two uprights, M M, each containing two rows of staggered holes, in any of which the arms N N, can be placed. On these arms shelves similar to the one partly shown at O are placed, and to receive the molds to be dried. Loose arms may be seen at P.

These shelves are distributed among the molders making dry sand molds and the finished molds are placed on them on the molders' floor. When a shelf is filled the crane picks it up and carries it to the drying oven car. As soon as the floor of the car is filled arms are placed in holes in the uprights so they will just clear the molds beneath and the first shelf is put in position, and so on until the top is reached. This arrangement allows molds to be stacked up on the cars to the full hight of the oven and without waste space, due to various hights of molds. It also allows the hot air to circulate freely over the top of the molds as well as on all sides and thus dry them quickly. The ease with which the molds can be handled is also conspicuous. When a carload of dried molds has been rolled out of the oven the traveling crane successively removes the shelves and distributes them about the floor.

Considerable manual labor is also saved in running the cars into and out of the ovens. Two drying ovens are now in use with two tracks and two doors to each oven, and in front of each track a loop of wire rope is anchored in the floor to take the hook of a pulley such as that shown at R, Fig. 6. One end of the wire rope is run through this pulley and fastened to the car and the other end is given a turn around the hook of the traveling crane as shown at S. A man on the floor then retains the free end of the rope while the crane hoists and pulls the car out of the oven. Similarly with loops and pulleys at the inner ends of the oven tracks, the cars can be pulled into the oven.

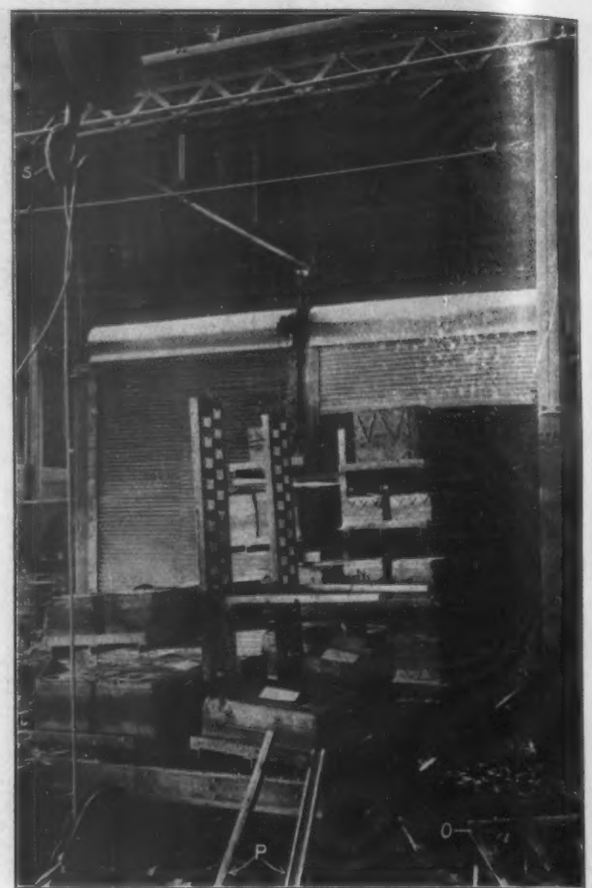


Fig. 6.—The Drying Ovens and the Special Car for Handling Molds.

The Finished Castings

After the castings are shaken out of the molds, they are picked up by overhead traveling cranes and carried

Fig. 5.—One of the Jib Cranes Equipped with an Air Hoist.

to the end of the foundry near the converters and loaded on narrow gauge flat cars. These take them through a sand blast room where they can be sand blasted if necessary and then into the cleaning room. Here the smaller ones are put into tumbling barrels after having the sprues, gates, &c., broken off. The larger castings have their sprues and risers cut off by cold saws. After this the fins, &c., are clipped or ground off, bad spots are repaired by electric welding and the castings are weighed and loaded on cars, or the company's automobile truck for delivery.

In no part of the plant do the castings or the raw materials travel backward. The plant has been so designed that the sand is brought into one corner of the building where it is ground and mixed and then delivered to the molders and core makers; the pig iron, ore, coke, scrap, &c., are brought into the diagonally opposite corner where they are charged into the cupolas and converters and made into steel; the molten metal is distributed over the molding floor and poured into the molds, the castings are shaken out, taken to the annealing ovens and from there to the cleaning room, through which they pass and are halted for various operations before being loaded for shipment. By continuously traveling forward through all of these operations no confusion is apparent in the foundry and the work is handled as quickly and economically as is consistent with good workmanship.

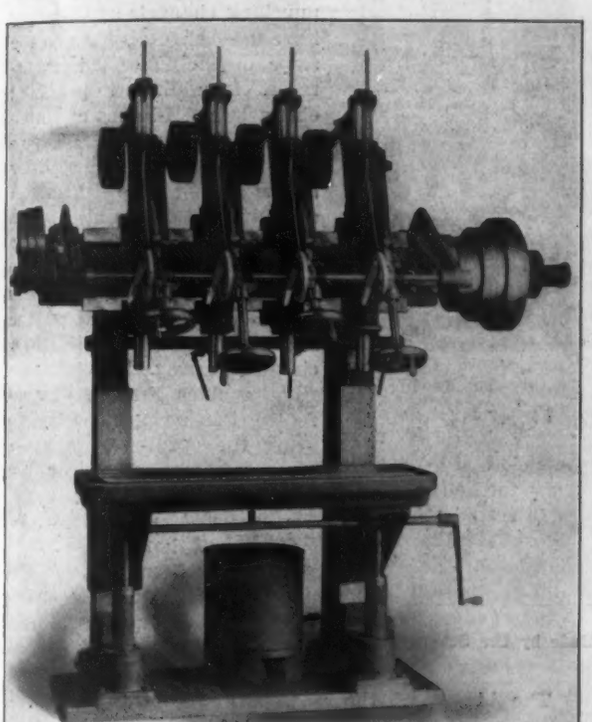
The Merchants Steel & Supply Company, Marquette Building, Chicago, has opened an equipment and machinery department, which is in charge of Loren Bugbee, to buy, sell and repair the general line of contractors' equipment and machinery, such as steam shovels, locomotive cranes, dinkies, dump cars, standard gauge cars and locomotives, boilers, engines, pumps, generators and miscellaneous machinery, as well as new and relaying rails and accessories of every description. The company is now erecting at its yard a shop for the overhauling and repairing of all kinds of machinery.

The Farris Bridge Company, Diamond Bank Building, Pittsburgh, Pa., has completed and is now distributing its 1911-1912 year book to county commissioners, borough engineers and a selected class of manufacturers. The book is leather bound, and its pages are arranged in weekly order, 3½ x 8 in., ruled in cross section for the purpose of making memoranda. The company constructs viaducts, coal tipples, mill buildings, light and heavy foundation work, reinforced concrete, &c.

The New Moline Multiple Spindle Drill

For heavy jig and forging work, drilling and reaming links, connecting rod work and various other jobs of a heavy character, a new multiple spindle drill, known as No. 23, is built by the Moline Tool Company, Moline, Ill. All of the spindles are fed independently. While the tool illustrated has four, other numbers of heads can be provided.

The maker's standard double spiral type of drive is employed, steel being used for the main spiral gears in the rail and phosphor bronze for those in the spindle. Ball thrust bearings are provided for the spindles and the spiral gears. A bronze spiral gear meshing with a rack cut from the solid in the bronze bushed steel quills provides the feed for the different spindles. The bronze spindle spiral gears are mounted on the inclined shaft, which is driven by bronze and hardened steel worm gearing. This shaft also carries a quick traverse hand wheel and is pivoted so that the worm wheels can be dis-



The No. 23 Multiple Spindle Drill Built by the Moline Tool Company, Moline, Ill.

engaged from the worms either by the hand latch or the automatic stop. Three-step cone pulleys drive the shaft extending across the front of the machine, that in turn drives the worms, each of which is connected to the shaft by a clutch controlled by a hand lever. Each worm has a hand wheel mounted upon it, thus giving hand worm feed when the worms are disconnected from the worm shaft. The spindles run in revolving sleeves on which the spindle spiral gears are mounted, instead of in the heads themselves, and provision is made in the lower bearings of these sleeves to compensate for wear. The spindles are counterbalanced and six changes of speed in approximately geometrical progression are rendered available by a three-step cone pulley and the back gear.

The columns, the rail and the table are of box section and the latter has a working surface which measures 14 x 62 in. It is provided with T-slots and can be adjusted vertically. A wide groove for oil or water surrounds the table.

The following table gives the principal dimensions and specifications of the tool:

Maximum distance between spindle centers, inches	60
Minimum distance between spindle centers, inches	6
Diameter of spindles, inches	2 7/16
Morse taper of spindles	No. 5
Travel of spindles, inches	10
Size of drill used, inches	2
Distance face of column to spindle center, inches	11
Maximum distance table to spindles, inches	28
Size of table, inches	14 x 62
Adjustment of table, inches	18
Weight of machine, pounds	6,500

The equipment regularly furnished with the tool includes a countershaft and wrenches, but does not include the pump, tank or piping for the cooling system, these being furnished at a slight additional cost.

National Metal Trades Association

The programme for the thirteenth annual convention of the National Metal Trades' Association at the Hotel Astor, New York, Wednesday and Thursday, April 12 and 13, is announced as follows:

Wednesday Morning Session.

Appointment of Convention Committees.

Reports of Officers.—(a) J. H. Schwacke, president; (b) Howard P. Eells, treasurer; (c) Robert Wuest, commissioner.

Reports of Standing Committees.—(a) Finance, J. H. Schwacke, chairman; (b) Joint Committee of the National Metal Trades' Association and National Founders' Association, J. H. Schwacke; (c) Industrial Education, F. A. Geier, chairman; (d) Apprenticeship, E. P. Bullard, Jr., chairman.

Report of Marshall Cushing, special representative at Washington.

Unfinished business.

New business.

Afternoon Session.

"Labor Efficiency Betterment."—Papers by John Calder, manager Remington Typewriter Works, Ilion, N. Y.; H. F. J. Porter, industrial engineer, New York; W. A. Grieves, employment superintendent Jeffrey Mfg. Company, Columbus, Ohio.

Participants in discussion: W. W. Coleman, vice-president Bucyrus Company, South Milwaukee, Wis.; H. N. Covell, Lidgerwood Mfg. Company, Brooklyn, N. Y.; William J. Manning, M.D., medical and sanitary officer, Government Printing Office, Washington, D. C.; F. C. Blanchard, works manager Ashcroft Mfg. Company, Bridgeport, Conn.; A. N. Dutton, vice-president Pearless Motor Car Company of New York, New York; W. F. Helmond, Underwood Typewriter Company, Hartford, Conn.; Frank Burgess, Boston Gear Works, Boston; M. W. Alexander, General Electric Company, West Lynn, Mass.; Geo. Gilmour, chief engineer engineering and inspection division of the Travelers' Insurance Company, New York.

Evening Session.

Convention banquet, Hotel Astor.

Thursday Morning Session.

Report of Committee on Employers' Liability Insurance, Wm. Butterworth, chairman.

Participants in discussion: Raynal C. Bolling, assistant general solicitor, United States Steel Corporation, New York; Miles M. Dawson, New York, expert in technical insurance, who was secured by the Russell Sage Foundation to make a study of insurance in Europe; J. A. Macdonell, liability insurance expert, New York; H. V. Mercer, chairman Commission on Compensation for Industrial Accidents, Minneapolis, Minn.

Afternoon Session.

"Impressions of American Mechanical Engineers on Foreign Shop Methods."—Papers by H. L. Gantt, New York, and Oberlin Smith, president Ferracute Machine Company, Bridgeton, N. J.

Participants in discussion: Henry D. Sharpe, treasurer Brown & Sharpe Mfg. Company, Providence, R. I.; George Mesta, president Mesta Machine Company, Pittsburgh; Wm. Lodge, president Lodge & Shipley Machine Tool Company, Cincinnati.

"The St. Louis Method of Technical Education," Lewis Gustafson, superintendent the John Ranken, Jr., School of Mechanical Trades, St. Louis.

Report of Resolution Committee, Henry D. Sharpe, chairman.

Report of Nominating Committee, M. H. Barker, chairman.

Election of Officers.

Adjournment.

The New York Metal Exchange Election.—James E. Pope of the Pope Metals Company was elected president of the New York Metal Exchange at the annual meeting, held April 3. A. B. Hall was chosen vice-president and Robert L. Crooke treasurer. The Board of Managers is as follows: B. Hochschild, H. W. Hendricks, G. E. Behr, E. Baerwald, Edwin Groves, Charles J. Marsh, W. Parsons Todd and A. Gardiner Cooper. The Arbitration Committee is composed of E. A. Caswell, E. J. Keane, P. R. Jennings, C. S. Trench and J. Langeloth.

The Alan Wood Iron & Steel Company, Philadelphia, Pa., on March 27 ran its first train of molten pig metal from its Swede furnaces over its new bridge across the Schuylkill River, connecting with its steel plant at Ivy Rock, Pa.

The Schatz Combination Punch and Shear

The Addition of a Bar Cropper Makes it Possible to Handle Rails, Bars and Structural Shapes

A type CP shearing machine combined with sectional bar cropper and punch has been installed by the Schatz Mfg. Company, Poughkeepsie, N. Y., for the Pittsburgh-Buffalo Company, at Marianna, Pa. This machine has a full equipment for cutting rails, angles, tees, rounds and squares at right angles or at a bevel of 45 degrees, as well as splitting plates of any of the ordinary lengths or widths. It will be used by the purchaser in the manufacture of mine equipment and more especially steel cars and tipples. Fig. 1 is a general view of the machine, and Fig. 2 gives some specimens of the work done by it.

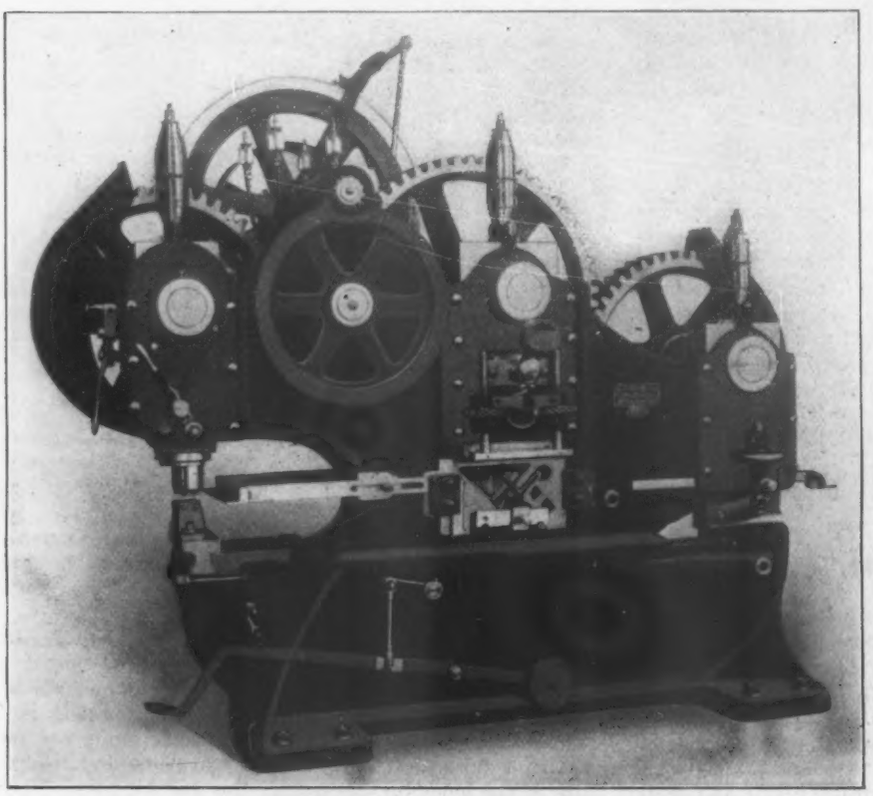


Fig. 1.—A Combined Punch, Shear and Sectional Bar Cropper Made by the Schatz Mfg. Company, Poughkeepsie, N. Y.

The frames are made from Siemens-Martin steel and are positively guaranteed by the builder against breakage. The use of this material makes the machines weigh about one-third as much as those of the same type built with cast iron frames. This results in securing machines requiring less floor space and having proportionately greater strength. The punch slides are of great width and are housed in bearings of ample proportions, thus securing perfect alignment at all times. The driving gears have cut teeth, and those connecting with the different parts of the machine are of the hydraulically molded type, which insures noiseless running. All the gears of the machine are protected by ample guards.

The capacity of the punch is 1¼ x 1¼ in. stock. A universal table consisting of a die holder and a horizontal jaw forms a part of the equipment. This table is especially suitable for punching plates, bars and all forms of structural shapes, both in the web and also in the flange close to the corner. For all ordinary punchings the vertical die holder is used, the horizontal one being employed for punching bent plates and punching, notching and coping flanges of channels and I-beams. The dies employed for punching channels and I-beams have a bevel to conform to the slope of the inner flange surfaces. In addition to punching channels and I-beams of standard dimensions, it is also possible to punch Bethlehem girder beams having wide flanges. A stripping off device also forms part of the equipment of the punch. It is circular in shape with an opening exposing the punch and is fastened on the housing of the punch slide in a circular bearing. This arrangement enables the operator to rotate the stripper so as to bring the opening in any desired position and make the punch visible from any angle. The material is held down and stripped off horizontally, thus preventing breakage of the punch when stripping material. A key is employed to hold the punches in position instead of a set screw.

The blades of the sectional bar cropper will cut angles, rounds, squares and tees at right angles, and it also can be furnished for cutting angles and I-beams at right angles without waste and without deforming the section. The ability to cut channels and beams without waste is an important feature especially where these shapes enter into the manufacture of other articles, since they are generally furnished in lengths from which a certain number of pieces can be cut. With this machine it is possible to trim ¼ in. from the end of a beam or channel instead of sawing it, which is the customary way. A miter attachment is also furnished with the

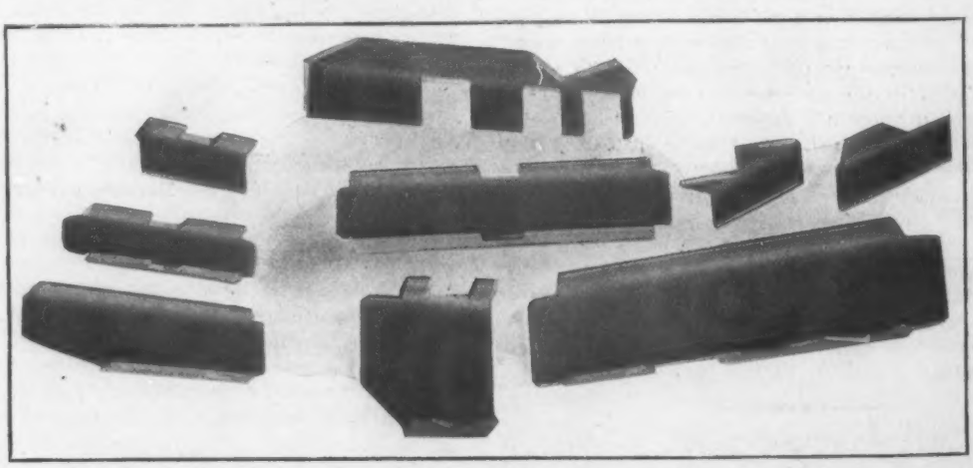


Fig. 2.—Some Specimens of Coping Done by This Machine.

cropper, which enables angle irons to be cut at a bevel of 45 degrees, either right or left. No filing is said to be needed to make pieces cut by this machine fit properly.

The capacity of the plate shear for splitting and shearing is 1 1-16-in. plates, and cutting flat bars 1⅝ in. thick. The shear blades are 14 in. long, and this part of the machine is equipped with an automatic separating device which prevents the cut portions of the plate from binding against the frame of the machine while the cuts are being made.

The plate shear and the cropper are operated by a disengaging gear consisting of a screw release with a weight and wide bearing surfaces. This gear is absolutely reliable and operates instantaneously in any position of the slide. The device is thrown into engagement automatically. The bar cropper and the large size of plate shear has a strong and novel hold-down. This consists of two screw spindles connected at the bottom by a cross member and is easily and quickly adjusted to any desired thickness of stock by a crank handle and worm gear.

The universal coping fixture, which is attached to the punch end of the machine, is especially suitable for coping and punching miters in the flanges of I-beams, channels and tees at one stroke. This fixture makes cuts with smooth edges and can be used to advantage in manufacturing parts from structural shapes.

The machines are made in seven different sizes, the smallest cutting plates ⅜ in. thick and 4-in. I-beams and channels, while the largest handles 15-in. I-beams and channels and 1 9-16-in. plates. The punch, shear and bar cropper can be operated either independently or in unison as may be desired by the operator.

A New Steel Rolling Mill for St. Louis

A steel rolling mill company is being organized in St. Louis, Mo., by William E. Guy. The capital stock, which already is oversubscribed, will be $350,000, and the company, which is not yet named, will soon be incorporated. Building operations will begin as soon as the site is determined upon. It is not yet decided whether the mill will be built in St. Louis or East St. Louis. The plant will require at least 10 acres, with railroad and water facilities.

The company will manufacture hard steel bars, angles and channels, and the plant will have a capacity of 48,000 tons a year. As there is but one plant in or around St. Louis in this line, it is believed that the field for supplying builders, agricultural implement makers, &c., is sufficiently large to warrant the building of a new steel rolling mill. A feature of the business, it is expected, will be the rolling of special reinforcing bars for use in concrete structures. Many builders have special or patented forms of reinforcing bars, which are made according to specifications. St. Louis is a large center for the production and distribution of railroad and other kinds of scrap, comparatively little of which is worked up into new forms there, and the new plant will furnish an outlet for much of that material. The company plans the installation of open hearth furnaces later on.

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Standardization by the Automobile Engineers

The Society of Automobile Engineers, 1451 Broadway, New York, with a membership of nearly 800 of the ablest engineers and experts having to do with the automobile industry, has within the year accomplished results that will be found to have made engineering history of a definite nature. Its work is of interest not merely to the technician, but to the layman who demands efficiency, safety and comfort in the use of his motor car, but who has little idea how largely these desired qualities are the fruit of vast research and labor.

Standardization is a keynote of the work of the society, that being the vital and imperative need of the producing end of any great industry. That standardization is a good thing is realized by many, but the necessity of it would be realized by many more if the situation were fully understood. For example, it is not clear to many of the business men associated with the automobile industry that there is any unnecessary complication of design. They do not realize that there are 300 or 400 more dimensions and designs for lock washers between the sizes of 3-16 and ½ in. than there ought to be. It is hard for the business man to see why any such situation should arise unless there existed some necessity for it. The explanation is clear.

A draftsman, for example, is called upon to make a drawing of an automobile axle. His instructions are to draw an axle capable of carrying a car of some given weight, and that, in a general way, it should be an I-beam axle of certain length and style. Entering into this axle are very many details as to size of hole for spring clips, pins for steering joints, &c., to accommodate the rest of the steering mechanism and permit the whole thing to slip into a car properly. The draftsman exercised his own judgment as to these details, not having before him any standard for the various details. He may choose a tubing for the steering cross rod that does not exist in stock. If he has no table of tubing sizes before him he makes it to suit his own fancy, as long as it will do the work. He will do the same thing for the shape of the heads of the screws and bolts, and for the size of the holes for the spring clips and for many other details. Every one of these things he may thus select may not exist in stock, may not even be of standard design.

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To guide the ideas of such draftsman is one of the principal functions of the Society of Automobile Engineers. The aim will be to put into the hands of every designing draftsman an engineer's pocketbook or a series of sheets, which shall show him what is available in the way of screws, tubing, lock washers, rod ends, grease cups and the many fittings that are standard. There will be no attempt to throttle original research as to changes in engines, changes in transmissions, or changes in any portion of an automobile. This does not alter the fact, however, that it is better to have a novel engine or a novel transmission made up of component parts which are standard and well tried out than one which is not only novel in design as a whole, but one in which every element is novel and untried.

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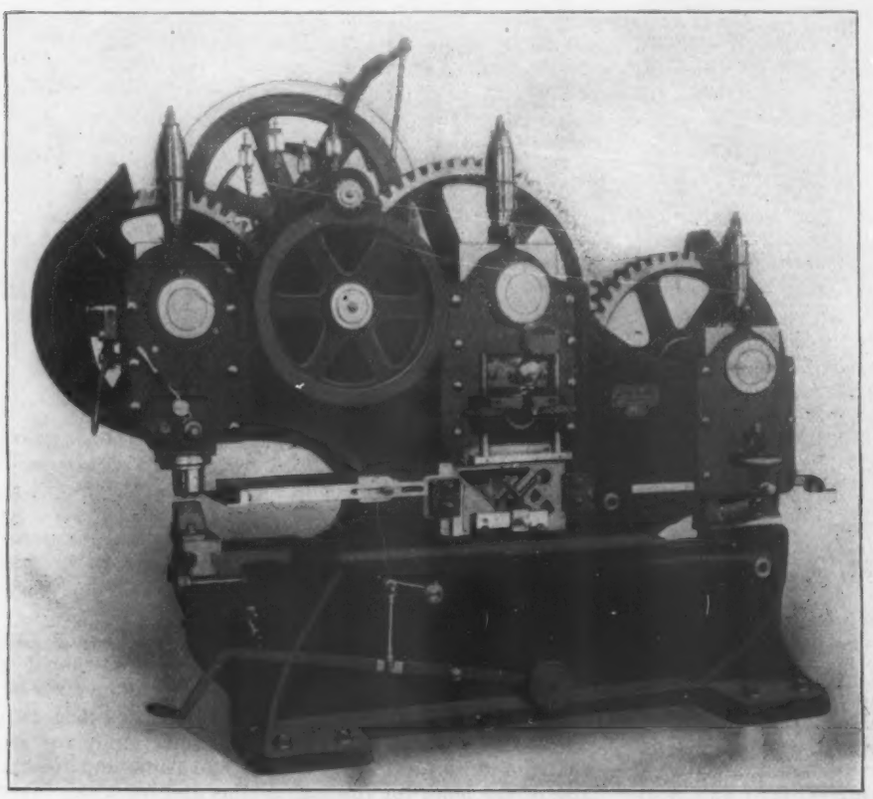

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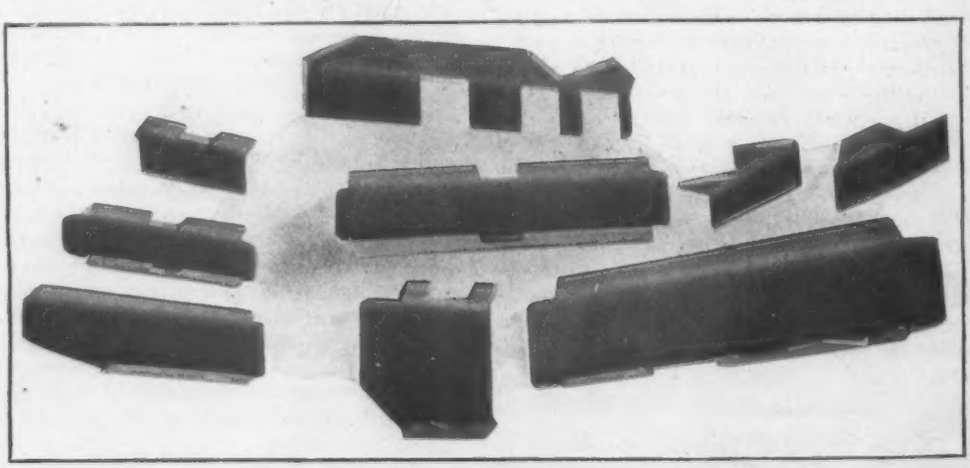

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The Enlarged Bettendorf Steel Car Plant

A Recent Addition Which More Than Doubles Its Capacity

The plant of the Bettendorf Axle Company, Bettendorf, Iowa, built in 1902, consisted of a brick building, 240 x 700 ft., on a 40-acre tract of land. During the past two years the plant has been enlarged until at present the factory grounds cover an area of 100 acres, and a number of new buildings have been erected. Fig. 1 shows the arrangement of the plant and gives some idea of its present arrangement and size, while Figs. 2, 3 and 4 show a portion of the foundry equipment. Fig. 2 is a view of the sand mixer and the conveyor for delivering sand at the various molding machines in the foundry. Fig. 3 is a view in the pouring room and Fig. 4 shows the annealing furnaces.

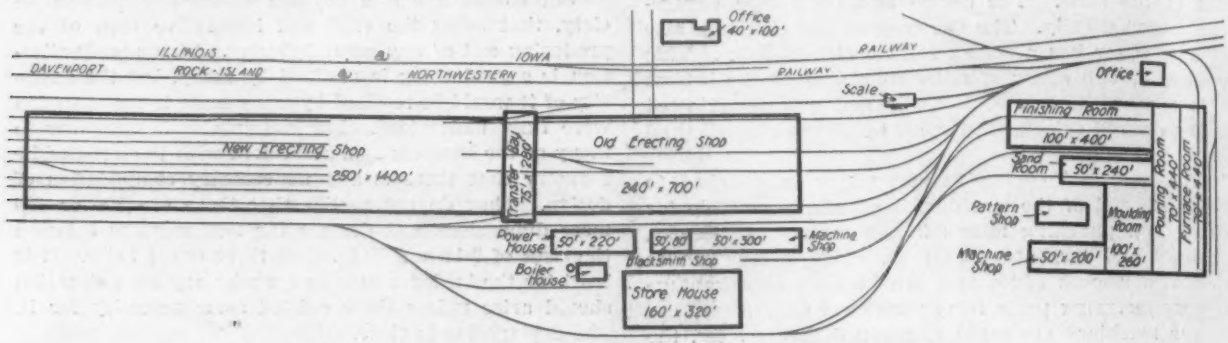


Fig. 1.—Plan of the Plant of the Bettendorf Axle Company, Bettendorf, Iowa.

The steel foundry, which is located east of the main shop, like the rest of the buildings, is brick and structural steel, divided into wings or bays, and space is provided for future growth. The furnace bay, which is at the end, is 70 x 440 ft., and is equipped with two 5-ton electric traveling cranes for handling molds and castings and a ladle crane having a 35-ton main hoist and a 5-ton auxiliary hoist. Both of these cranes span the entire width of the bay, and in addition there are an electric traveling wall crane and two jib cranes for handling the furnace spouts, each of 5 tons capacity. The present equipment of the foundry is two 25-ton open hearth furnaces, which are designed to use either oil or gas as fuel. The burners and the doors and the door frames are all water cooled. The furnaces are served by a Morgan charging machine and the entire floor, which is of concrete, is flush with the tops of the charging car rails. Ample raw material storage room is provided and all the handling is done by a crane and lifting magnet. The pig iron and the scrap storage bins, which have a capacity of about 5000 tons, are of reinforced concrete and are located in the furnace bay adjacent to the furnaces. A 500-ton hydraulic scrap shear is located in the furnace bay for shearing rails and heavy scrap, which is taken to the bins after it has been cut. Gates, risers and defective castings are loaded on the charging cars in the pouring bay and taken directly to the furnace bay for charging.

A continuous sand mixer runs through the foundry department handling the sand and conveying it to the sand mixer shown in Fig. 2. This room is 240 ft. long and 50 ft. wide, and its equipment includes one 5-ton 48-ft. span electric crane, with a ½-yd. grab bucket, two 25-ton continuous heavy sand mixers, two 15-ton facing sand machines and a number of concrete bins for storing the sand. These bins can store enough sand to last through the winter, and are heated with steam coils to dry the sand.

The melting rooms are two in number and measure 50 x 260 ft. each. Their equipment includes electric traveling cranes, having a capacity of 5 tons, miscellaneous jib cranes, pneumatic ramming tools, Bettendorf core and molding machines and a continuous sand conveyor delivering the sand at the various machines from the mixer. The annealing and chipping rooms, which are arranged in two bays, each 400 ft. long and 50 ft. wide, contain two continuous annealing furnaces of the type shown in Fig. 4.

Fig. 2.—The Sand Mixer and the Conveyor in the Foundry.

The new erecting shop is 250 x 1400 ft., and 60 ft. high. In connection with the old shop, which it adjoins, a single building, 2100 ft. long, is formed. This shop con-

Fig. 3.—A View in the Pouring Room.

tains 15 electric traveling cranes, ranging in capacity from 3 to 10 tons. Underframes and cars are made here, and the original shop is divided into five bays. The two on the south are devoted to the manufacture of bolsters, small car parts and truck springs are made at the opposite side, and the center bay is used for storage and assembling the underframes. A transfer bay equipped with cranes and magnets for distributing material from the old shop to the four bays of the new addition connects the two parts. In the new part the two north bays are used for fabricating and erecting underframes and cars, the south central bay for securing floors and sides to the frames, and the other bay for storing small car parts and specialties.

The main machine shop is utilized exclusively for building and repairing the machinery used throughout the plant. All of the tools, which include planers, engine and turret lathes, radial drills, crank shapers, saws, bolt cutting machines and drill presses, are motor driven. Tools are made and dressed in a blacksmith shop, 50 x 80 ft., at the end of the machine shop. Included in its equipment are forges, hammers, presses, hardening furnaces with electric pyrometers and a bolt and rivet heading machine. Facilities for repairing the large number of motors used in the plant are afforded by the electrical department, which is located in the main shop.

The bay of the foundry building adjoining the molding room is used as a metal pattern and machine shop and contains tools for building and repairing metal patterns, molding machines and other machinery used in the foundry. The wood pattern shop, 50 x 140 ft., is on the upper floor of a separate building. A motor driven automatic stop-and-start planer, a jointer, a pattern grinder, saw tables, a band saw, a lathe and a revolving oil stone form part of its equipment.

The power plant is in two buildings, a boiler house, 50 x 80 ft., and an engine and pump house, 50 x 220 ft., adjoining it, both at the end of the blacksmith shop.

Fig. 4.—The Furnaces in the Annealing Department.

In the boiler house are four vertical water tube boilers with automatic chain grate stokers and a fuel economizer. Coal and ashes are handled by a conveyor with automatic weighing hoppers. Space remains in this building for installing two additional boilers. The engine and pump house contains two duplex fire pumps, each having a capacity of 1000 gal. per minute, and six hydraulic pumps capable of supplying 1230 gal. per minute at a pressure of from 350 to 3000 lb. per square inch. These pumps supply the hydraulic presses throughout the plant and three weighted and two actuated accumulators govern them. Three compressors having an aggregate capacity of 3400 cu. ft. per minute furnish the compressed air required. An exhaust steam turbine directly con-

nected to a 500-kw. direct current generator, which was illustrated in *The Iron Age* February 23, 1911, and two tandem compound engines directly connected to 100-kw. direct current generators supply light and power. In a system of concrete tunnels are laid the hydraulic and compressed air piping and the electrical conductors to the various buildings.

The Climax Spur Geared Chain Hoist

A new spur geared chain hoist is being manufactured by the Climax Hoist Company, 1753 North Howard street, Philadelphia, Pa. Simplicity and efficiency, without excessive cost, was the aim in its design. Fig. 1 is

Fig. 1.—A New Spur Geared Chain Hoist Manufactured by the Climax Hoist Company, Philadelphia, Pa.

a general view of the hoist, while Fig. 2 gives an end view and an axial section.

This hoist has but two spur gears and two pinions to obtain the necessary reduction from the hand chain wheel to the load sprocket. The load is carried on steel rollers, and the gears are inclosed in a dustproof case and run in a bath of oil, minimizing friction and enabling quick and easy operation. A friction retaining brake automatically sustains the load at any point, and is secure, smooth and noiseless.

The load chain runs in a sprocket wheel, *b*, Fig. 2, which is keyed to a long hub or sleeve, *c*, cast in one piece with the internal load gear *g* and carried on roller bearings in a suitable housing. This internal gear is driven by a spur pinion cast in one piece with an internal intermediate gear carried on a steel stud attached to the hoist cover. This gear is driven by the spur pinion located on the chain wheel shaft, which passes through the hub of the load gear to the opposite end of the hoist. The automatic friction brake is located between the hand wheel and the body of the hoist, and hoisting is accomplished by pulling the right hand side of the chain which rotates the mechanism. Lowering is accomplished by operating the left hand chain. The rotation of the hand wheel, through a pawl actuates the friction brake and permits the load to descend only as fast and as long as the chain is pulled.

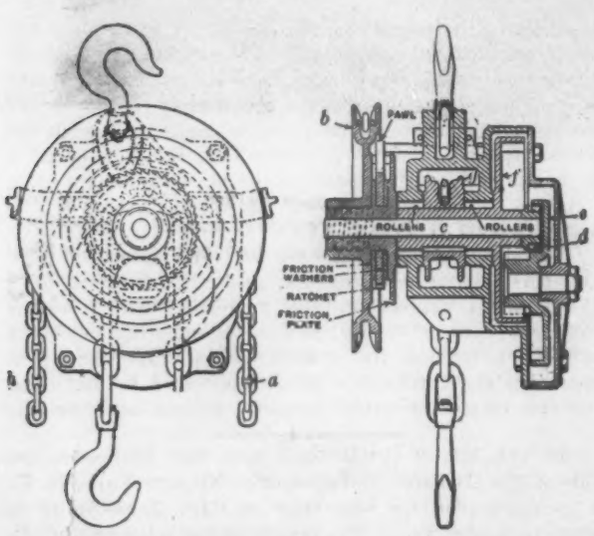


Fig. 2.—End View and Axial Section of the Climax Spur Geared Hoist.

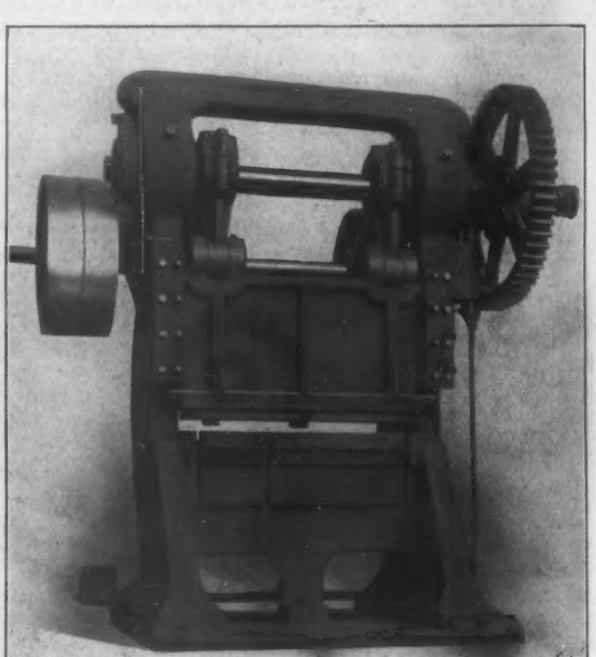
The new hoist has very few parts, and all are made to standard size, so that any one may be easily replaced. Seven sizes are made, having rated capacities of ½, 1, 1½, 2, 3, 4 and 5 tons.

A Large Aetna Multiple Punch

A new multiple punch of especially rigid construction has been brought out by the Aetna Foundry & Machine Company, Warren, Ohio. It is built in sizes ranging from 30 to 54 in. between the housings and for either belt or motor drive.

The housings are one-piece castings, connected at the top by a fitted cap. The bearings are solid eyes fitted with renewable cast iron bushings, having bronze linings. Set screws provide for adjustment to compensate for end and side wear of the sliding heads. Bronze shoes which are not shown are placed under the pitman to take up lost motion, the adjustment being secured by wedges driven in by a tap bolt.

The gear is equipped with the builder's standard automatic steel clutch, which is thrown in by a heavy spiral



A Large Multiple Punch Built by the Aetna Foundry & Machine Company, Warren, Ohio.

spring when the foot lever controlling it is depressed and is automatically released when the pressure is removed. The die table has a direct bearing at the center upon the bed plate to insure rigidity and in addition is tongued and grooved to the housings, to which it is attached by fitted bolts. The machine rests upon a heavy bed plate bolted to the foundations. The power is transmitted to a solid forged eccentric shaft, and when the punch is motor driven, the motor is placed either on the side of or between the housings.

The dimensions of the 36-in. machine, which will serve to give some idea of the proportions of the entire line, are overall hight, 6 ft. 7 in.; hight between bed plate and center of eccentric shaft, 5 ft. 4 in. and size of base plate, 4 ft. 6½ in. by 4 ft. 1½ in.

New Brown Ore Unloading Plant

A Recent Installation for the Maryland Steel Company

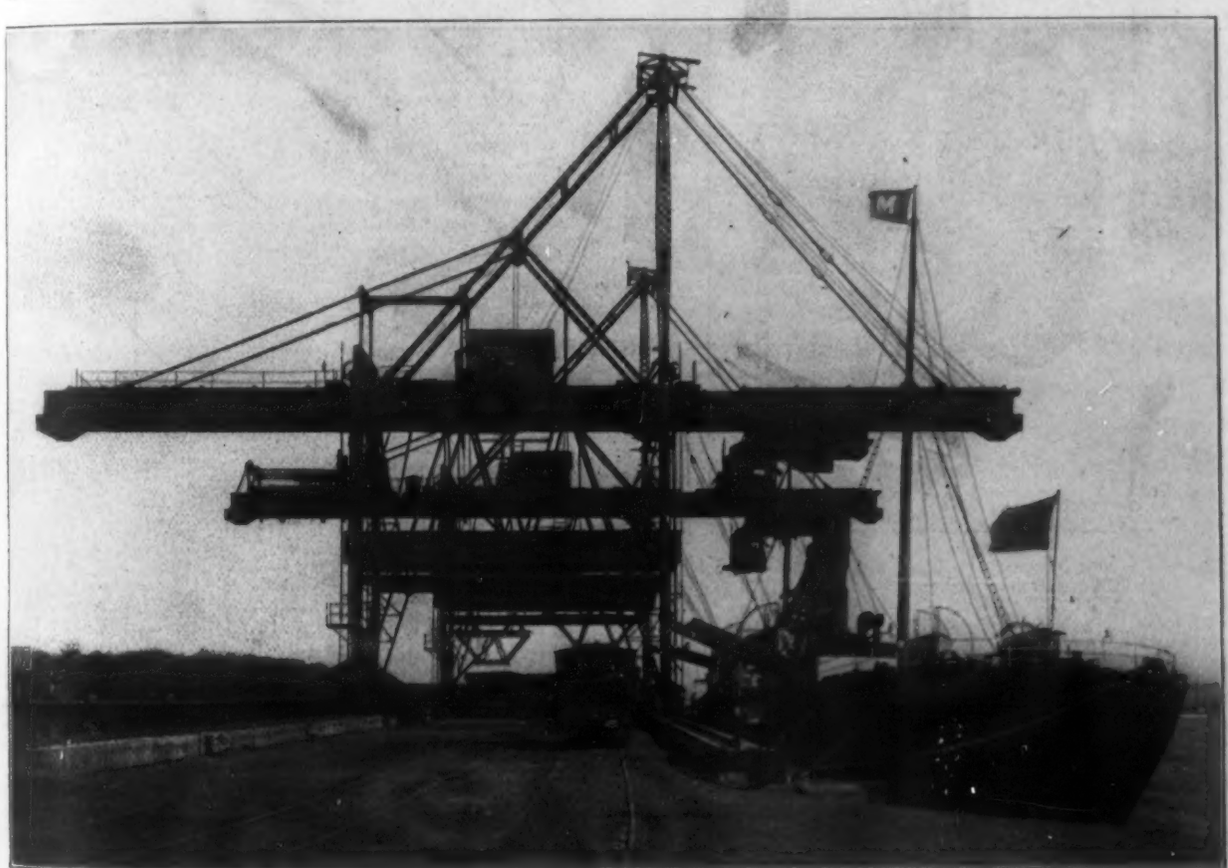
A new fast plant for unloading Cuban iron ore for the Maryland Steel Company having some new features has recently been placed in operation by that company at Sparrows Point, Md. The plant consisting of two electric fast unloaders, each equipped with a man trolley and patent two-rope ore grab bucket, was built by the Brown Hoisting Machinery Company, Cleveland, Ohio. The buckets have a capacity of 7½ tons each, and each unloader has a capacity of 500 tons per hour. The plant is designed for unloading directly from the boats to the cars. As the storage capacity is limited to a small pit in the rear, no bridge is required.

The unloaders consist of a portal pier cantilever structure spanning three standard gauge railroad tracks, with a distance of 46 ft. between legs, arranged with a liftable apron or cantilever projection at the front, or water end and with a cantilever projection at the rear. The loaded trolley hoists its load at the rate of 185 ft. per minute, and travels along the runway at the rate of 600 to 800 ft. per minute. The travel of the unloader along its tracks with a full load is 75 to 100 ft. per minute. The cantilever projection in the rear extends 50 ft. from the rear legs, and provides a trolley travel of 35 ft. from the rear legs. The total length is 150 ft., and the total trolley travel 123 ft.

The apron extension on the front or vessel side of the pier is operated by power. A latch is provided at the top of the mast to lock the apron when it is in a raised position, relieving the strain on the raising and lowering rope. The mechanism for raising and lowering the apron is connected to the pier traveling motor by a jaw clutch. The apron is attached to the fixed portion of the track in the pier by hinged connections, so designed as to prevent any abrupt break in the track at this point and to provide a smooth continuous runway for the trolley. The cantilever in the rear is similar in general construction to that of the trolley track within the pier and the apron.

The moving gear is operated by power from the motor house, being controlled by an electric brake. The entire operation of the plant is under the control of the operator in the trolley at any position along the runway. Power is transmitted from the motor by a line of shafting down each side of the pier, and this, together with the necessary train of gears, is connected to the track wheels, so that the unloader can be propelled along the tracks, on which it is mounted, in either direction. The trolley is so designed that the operator can turn the bucket by a turntable through an angle of 90 degrees. Each unloader has a movable guide hopper arranged to travel on flanges of the channels comprising the lower chord of the trusses in the pier. The hopper is placed in the desired position over a car, and the bucket is discharged into the hopper.

The weighing hopper has been dispensed with and an entirely new weighing mechanism is provided to meet the requirements of this plant. The scale is located in the end of the runway in the cantilever and weighs both the trolley and the bucket. The scale is shown on the rear unloader in the engraving, the one in the foreground not being provided with a scale. The weighing is done by an operator in the scale house near the scale. The plant is designed to weigh only the ore that is placed on the storage pile. However, should it be desired to weigh the ore before it is dumped into the cars this can be done by running the trolley back to the scale and then, after weighing, moving it forward to a position over the hopper.



The New Ore Unloading Plant Installed for the Maryland Steel Company by the Brown Hoisting Machinery Company, Cleveland, Ohio.

The power for moving each unloader along the dock and raising and lowering the apron is furnished by a 75-hp. direct current 220-volt motor. Each trolley is equipped with a 250-hp. motor for hoisting, a 75-hp. motor for racking the trolley and a 5-hp. motor for operating the turntable. The hoist motor is controlled through master operated magnetic control equipment.

In Vol. III. of the Revised American Statesmen Series of the Carborundum Company, Niagara Falls, N. Y., a pocket leaflet, the biography of Capt. John Smith is given in lighter vein. The text is by the president of the company, F. W. Haskell, and is entertaining. There is no mention of carborundum until the last page.

Steel Mill Lighting

A Study of the Main Requirements

BY ROSCOE SCOTT, CLEVELAND, OHIO.

(*With Supplement.*)

To-day is assuredly the day of agitations, investigations, alterations and innovations in methods and means of artificial lighting. Officials of companies operating blast furnaces, foundries; steel, rolling and wire mills; galvanizing plants and forge and machine shops are today, as never before, asking the question, What is satisfactory illumination and how shall we obtain it? It is the aim of this article to summarize the latest broad developments in the art of artificially illuminating buildings where iron and steel is manufactured and worked into commercial forms, to cite the experiences of manufacturers who have done pioneer work in the study of industrial illumination, and to offer here and there practical suggestions—all of which it is hoped may be of help to those who are trying to find out how to obtain satisfactory illumination in their own particular establishment.

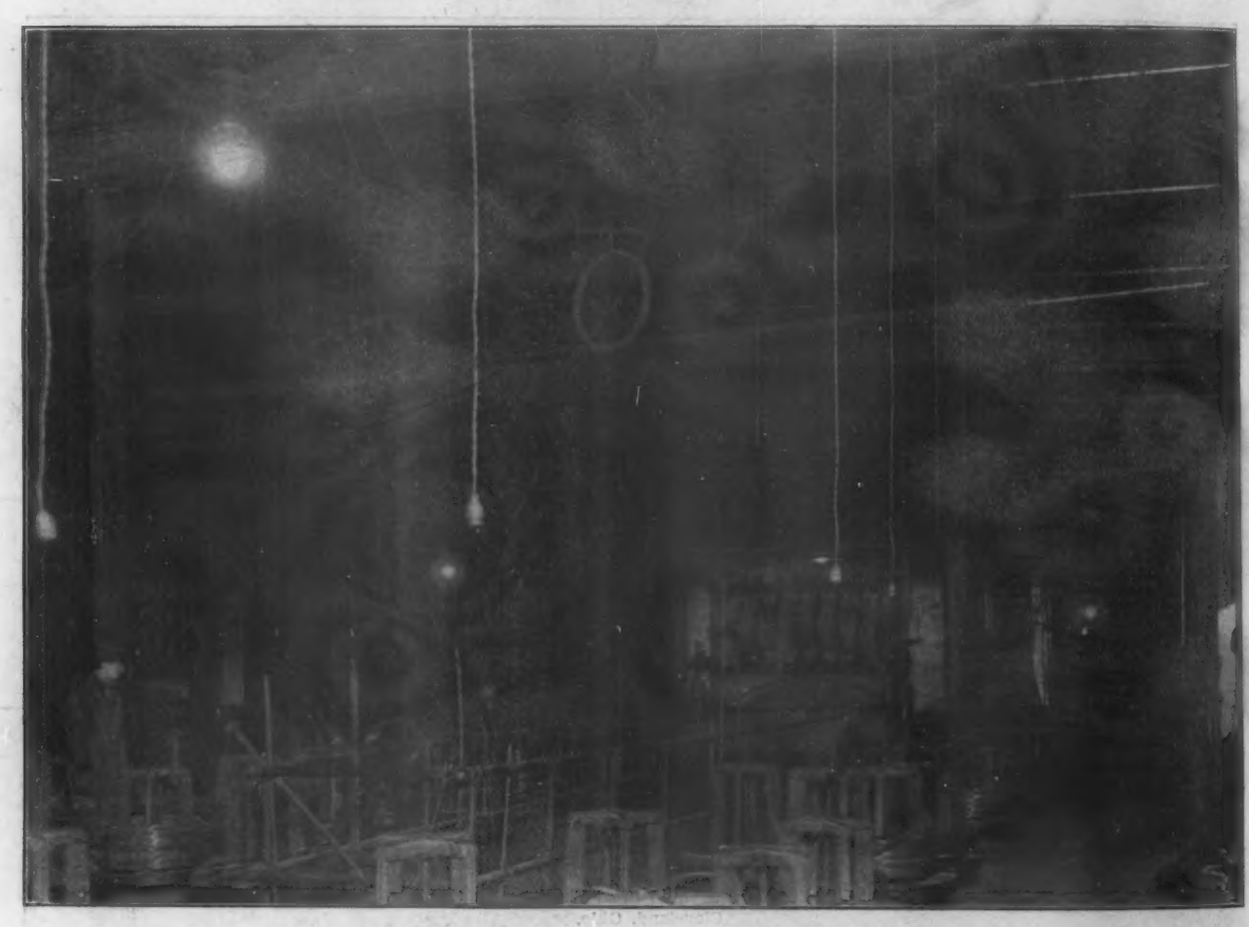


Fig. 1.—A Trial Installation of Flaming Arc Lamps in a Galvanizing Plant.

A number of influences have been at work, all converging toward a movement for better lighting. Two of these—namely, invention and illuminating engineering—are especially potent and have been responsible for radical changes in the commercial standards of illumination. Invention is giving us better and better light sources, while illuminating engineering, systematic and observant, is telling us how to apply the products of invention to secure the most desirable results. While invention has wrought improvements in both arc and incandescent electric lamps, its effect has been to incite sharp competition between the two as candidates for mill and shop lighting. Formerly each lamp had a definite place of its own—the incandescent at the bench, in the office or where portable lights were required, and the arc high overhead or in the yard. Now efficient incandescents of over 400 cp. in a single bulb and clusters of smaller incandescents having an aggregate candlepower of arc proportions can be obtained.

In February, 1894, the first inclosed arc lamp embodying the points which later caused it to become so popular was publicly exhibited. This lamp gives a light that is somewhat steadier and less dazzling than that of the old open arc, and since it requires less frequent trimming it costs less to maintain; but its efficiency is less than one-half that of the open arc. More recently, the invention of the flaming and luminous arcs has increased the efficiency, although the increased charges due to larger investment in these newer lamps have handicapped their introduction.

The progress of incandescent lamp invention is indicated in the following table, which gives the dates of introduction of the successive kinds of filament, efficiency in watts per candlepower and the mean horizontal candlepower developed per horsepower of energy input:

Lamp.	When introduced.	Watts per candlepower.	Candlepower per horsepower.
Edison's bamboo	1880	6.46	115.5
Flashed carbon	1886	3.1	240.6
Gem	1905	2.5	298.4
Tantalum	1906	2.0	373.0
Tungsten	1907	1.25	596.8
Mazda	1910	1.15	648.7

Edison's early bamboo filament lamps gave about 115 candlepower per horsepower (6.46 watts per candle),

Fig. 6. A Galvanizing Plant Illuminated by Mazda Clusters.

Fig. 7. Mazda Lamps in a Wire Cleaning House.

Fig. 8. View Showing Light Emitted by Incandescent Rods in a Rod Mill.

Fig. 9. A Boiler Shop Illuminated by 500-Watt Mazda Lamps.

Fig. 2.—An Example of Bad Lighting.

while the latest incandescents, the Mazdas, give in the larger sizes as much as 648 candlepower per horsepower (1.15 w.p.c.). Moreover, the range of sizes has been widened and the quality of the light improved.

During recent years so many new illuminants have appeared that were it not for the science of illuminating engineering that has sprung up to meet the exigency, many an electrical engineer would be like a boy with a chest of sharp but unfamiliar tools. In 1906 the Illuminating Engineering Society was formed in New York City, the objects of the society, as stated in its constitution, being "the advancement of the theory and practice of illuminating engineering, and the dissemination of knowledge relating thereto." The parent body is flourishing, with a membership of over 1600, and has sections in various cities. Several prominent illuminating engineers are specializing entirely in industrial lighting, while tests and investigations of mill illumination are frequently reported in the *Transactions* of the society and of its sections.

Fig. 3.—A Comparison of the Illumination Given by a Bessemer Converter at Full Heat and an Inclosed Arc Lamp.

Besides invention and illuminating engineering, the merging of iron and steel interests has contributed toward the movement for higher efficiency in lighting. Still another factor has been the creation of industrial lighting departments by progressive lamp manufacturers. The engineers of these departments place themselves at the disposal of the technical staffs of iron and steel concerns, furnish such data as they possess on lamp performance and suggest how the lighting units should be installed and used to give the most satisfaction.

Characteristics of Iron and Steel Mill Lighting Service

Striking differences distinguish the conditions affecting illumination in the iron and steel and related industries from the conditions found in most other classes of lighting. In the first place, the work done is of an absolutely practical nature; fine art and sentiment play little or no part in it. Therefore attempts at decoration, which increase the cost of fixtures, reflectors or lamps without having any utilitarian value, are absurd. Especially is this true in the case of large units or clusters which are hung so high that the details of the apparatus are never noticed.

The prevalence of dirt is another characteristic of this class of service. Flying particles of slag, sand and coke dust in furnaces and foundries and oily dirt in blacksmith and machine shops are serious, though unavoidable, hindrances to the illumination of these places. Dense clouds of steam from exhaust pipes have much the same effect as floating dust in counteracting the illuminating effect of the lamps. In shops where dirt and dust are produced in very large quantities it is often uneconomical to use lamps with any interior mechanism, as the deposit on these parts clogs them and makes it necessary to overhaul the lamps at frequent intervals, take out the moving parts and either scrape them with

Fig. 4.—Improper Lighting.

Fig. 5.—Proper Light.

Two Examples of Lathe Lighting, Showing How the Use of the Right Type of Reflector Obviates Glare.

emery cloth or clean them in acid. Even with lamps having no mechanism such as incandescents, dirt and dust, if allowed to accumulate, will greatly reduce the light, so that it is advisable to establish a regular cleaning schedule to secure permanent good service.

There is probably no other class of buildings in which the illumination, due to the character of the work itself, varies so much from minute to minute as in iron and steel mills, on account of the large masses of metal handled in an incandescent state. The extreme of variation is found near Bessemer converters. During the blow the central part of the mill is filled with such a flood of light that artificial illuminants appear puny by contrast. This difference is clearly shown in Fig. 3. Consequently the artificial lighting system needs to be exceptionally powerful to give satisfactory illumination when the metal has ceased to furnish much light, and the after effect of the blow or pour is still hindering the workmen's ability to see.

It is not generally realized what a large and disturbing factor glowing metal forms. For example, in a rod mill where there are 900 ft. of incandescent steel rod, with an average diameter of ½ in., exposed, the incandescent area is 150 sq. ft., or 21,600 sq. in. Assuming an intrinsic brilliancy of only 0.01 cp. per square inch, the rods emit a total spherical candlepower of 216, or more than as much as an ordinary inclosed arc lamp. An example of the amount of light emitted is given in Fig. 8.

Two of the most important requirements for good artificial illumination in iron and steel mills and shops are steadiness and uniformity. The first may be defined as absence of flicker. Some lamps, when they get out of adjustment or when the voltage supply is low, chatter noisily, apparently in frantic effort to regulate themselves. Under such conditions the workmen are not only subjected to the annoyance of flicker, but their attention is likely to be transferred from the work to the misbehaving lamp.

Absolutely steady light is impossible in foundries, furnace plants and steel mills, owing to the variations in the light emitted by the incandescent metal, but even in such places plenty of artificial light should be provided so that the changes from noonday brightness to semidarkness may be less pronounced and glare effect may thereby be reduced. Obviously, the stronger the artificial light the smaller is the percentage of the total light received from the metal and the less is the percentage of variation. In machine shops and in all mills where large masses of intermittently flaming or glowing material are not used a close approach to absolute steadiness may be secured by the proper choice of illuminants.

If electricity be supplied at constant voltage to an incandescent lamp the light remains practically steady. With arc lamps, even with steady voltage, there is a continual variation in candlepower, due to the continually changing physical conditions at the arc. Whenever the supply voltage falls below normal—as it will at times in all mills and shops—the candlepower also drops, the amount depending upon the type of lamp. Certain types of electric arc lamps vary in candlepower as much as 7.5 per cent. for a 1 per cent. change in voltage, while other types vary as little as 2.65 per cent. The common carbon incandescent under a 1 per cent. change in voltage varies about 5.55 per cent. in candlepower, and the Mazda incandescent about 3.68 per cent.

The following table shows the voltage at which some commercial lamps recently tested by the writer failed to operate when the pressure was gradually reduced. The lamps were all in good operating condition when tested and were set for normal operation at 110 volts:

Type of lamp.	Voltage of extinction.
4-amp. direct current luminous arc	55
3.5-amp. mercury arc	97
6-amp. alternating current carbon inclosed arc	87
60-watt carbon incandescent	Still glowing at 50 volts. In a dark room glow can be seen below 30 volts.
40-watt Mazda incandescent	Still glowing at 20 volts. In a dark room glow can be seen below 10 volts.

No lamp can be expected to give good results on a system where the voltage fluctuates violently. Reasonably constant voltage should be secured by providing self-regulating generating machinery, switchboard regulating apparatus and conductors of large carrying capacity.

The second important requirement for good artificial illumination in iron and steel mills and shops is uniformity. Assuming that there are perfectly steady lights, if these are not properly installed they will not produce uniform illumination and the effect in extreme cases will be intolerable. It takes a certain time after passing from a brightly lighted to a dimly lighted room for the eyes to accommodate themselves to the change so as to distinguish objects readily. Just so, when a mill or shop is brightly lighted in some portions and is dark in others, the eyes of any workman who has to walk from one part of the building to another are continually accommodating and reaccommodating themselves, and only so long as he stays in one place and keeps from looking at the dark and bright spots in other parts of the room can he see to the best advantage.

Methods of Securing Uniform Illumination

In most cases the desired end will be accomplished by providing a sufficient number of lights, well distributed above the working area, so that there will be a minimum

of dark corners and shadows. Instead of using a single 1000-cp. unit to light a shop of a given size, two units of 500 cp. each, or better yet, 10 distributed 100-cp. units should be used. Each subdivision in the size of the unit makes for uniformity and eye comfort. Where units of extremely high candlepower are already installed it may, for reasons of convenience and economy, be desirable to retain the existing arrangement of outlets, and when changing the kind of lamp used to substitute high candlepower lamps or cluster units of an improved variety; but from an illumination standpoint it is better to subdivide the units and thus obtain a greater degree of uniformity. The artificial illumination of a large room in an iron or steel mill may be considered fairly uniform if tests show that it does not vary more than 100 per cent. from the average in different parts of the working area.

Glare

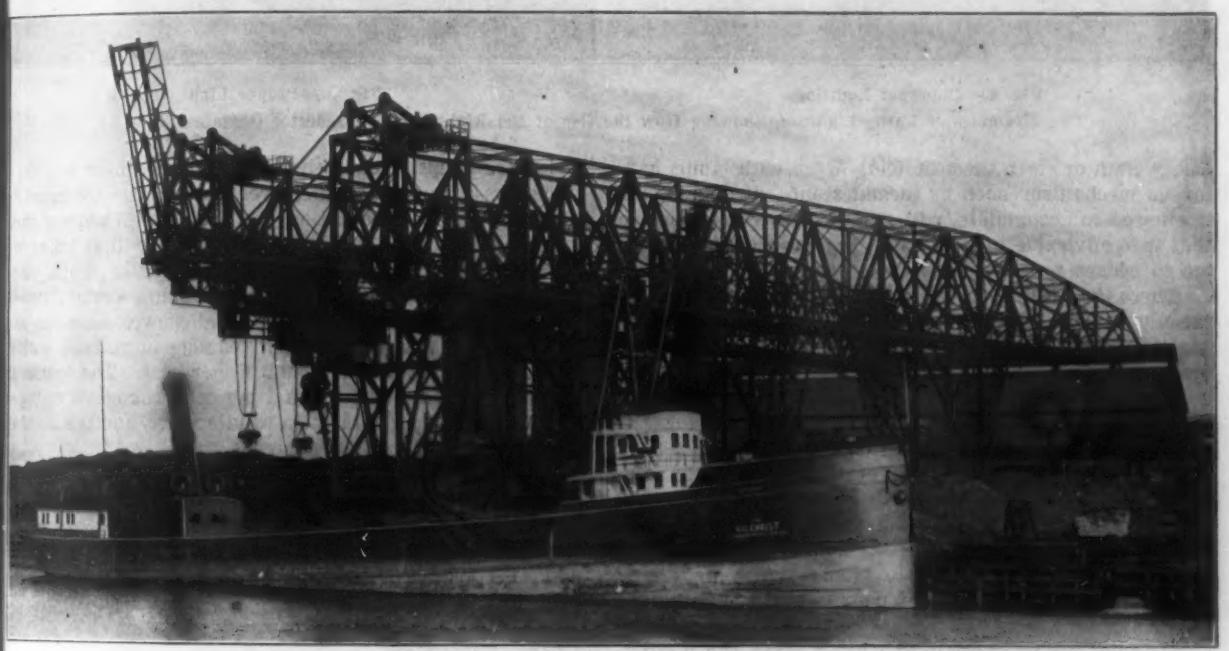
All the benefits of uniform illumination may be counteracted if the lamps are so installed as to cause a glare effect. They should either be so high as to be quite outside the ordinary range of vision, or should be provided with suitable globes, shades or reflectors. Particularly is this true in mills and shops where accidents are likely to occur. Pointing machines in wire mills, for example, should not be lighted by unshaded incandescents hung directly in front of the worker's eyes. The local lamp should be provided with a reflector or else a sufficient number of lamps should be installed up above so that the local lamp may be removed altogether.

In machine shops one sees the most glaring violations of that cardinal principle of good local illumination, "light on the work, not in the eye." Fig. 4 shows a typical case of bad lathe lighting, where the workman, to shield his eyes, had hung a piece of paper over the lamp. The next view, Fig. 5, taken with the same exposure (1 min. 10 sec.), shows the same lathe lighted by a lamp in a steel reflector, which greatly increases the illumination on the work and at the same time removes the glaring light source from the workman's range of vision.

The Jones & Laughlin Steel Company, Pittsburgh, has issued a leather bound booklet for its tin plate department, devoted to ratios of odd sizes of tin plate. These ratios represent the relation between a box of tin plate of a given size, and the base box of 112 sheets, 14 x 20 in. The price on any given size of tin plate is obtained by adding to the base price of the weight and quality desired, such extras as may be required by the length or width of the size ordered; also such quantity and odd size extras as may apply, and multiplying the sum thus obtained by the ratio given for such size in the tables. The company's tin plate business has been increasing, and as announced recently its tin plate capacity will be nearly doubled by additions now under way.

Unloading Pig Iron with Lifting Magnets

At the Indiana Harbor plant of the Inland Steel Company, two 62-in. lifting magnets made by the Cutler-Hammer Mfg. Company, Milwaukee, Wis., recently unloaded 4,000,000 lb. of pig iron in 10½ hr., from the Erwin L. Fisher, a sister ship to the one shown in the engraving. The vessel docked at 7:15 a.m., and work was commenced 20 minutes later, continuing with only a half-hour interruption at noon for oiling and inspection until 6:35 p.m. At 7:20 p.m. the boat cleared, the total time at the dock being 12 hr. and 5 min. During the 10½ hr. that the work of unloading was carried on the maximum number of lifts made in any one hour was 73 and the minimum



Unloading 4,000,000 Lb. of Pig Iron with Two 62-In. Lifting Magnets Made by the Cutler-Hammer Mfg. Company, Milwaukee, Wis.

45. In all 1281 lifts were made by the two magnets used, the average lift per magnet being 3427 lb.

Aside from the speed which is secured by the use of these magnets fewer men are required. Speed is of course very desirable, especially in the busy season and quick unloading enables more trips to be made. With the lifting magnets only two or three men are needed in the hold of the vessel, and no time is lost in filling buckets, as a load can be picked up as soon as the crane operator closes the magnet circuit. The work of unloading the vessel can be carried on regardless of the weather, since the men in the cabs of the bridges and the hold of the vessel are sheltered.

As a forerunner of the annual Master Car Builders' convention at Atlantic City in June information has been received from the Royersford Foundry & Machine Company of Royersford and Philadelphia, Pa., that it has engaged double space this year, in which an even more comprehensive exhibit than ever will be made of Sells roller bearings; Rollerine, the new roller and ball bearing lubricant, and punching and shearing machines, all products of the Royersford Company. Manager John D. Sells will be in charge as usual.

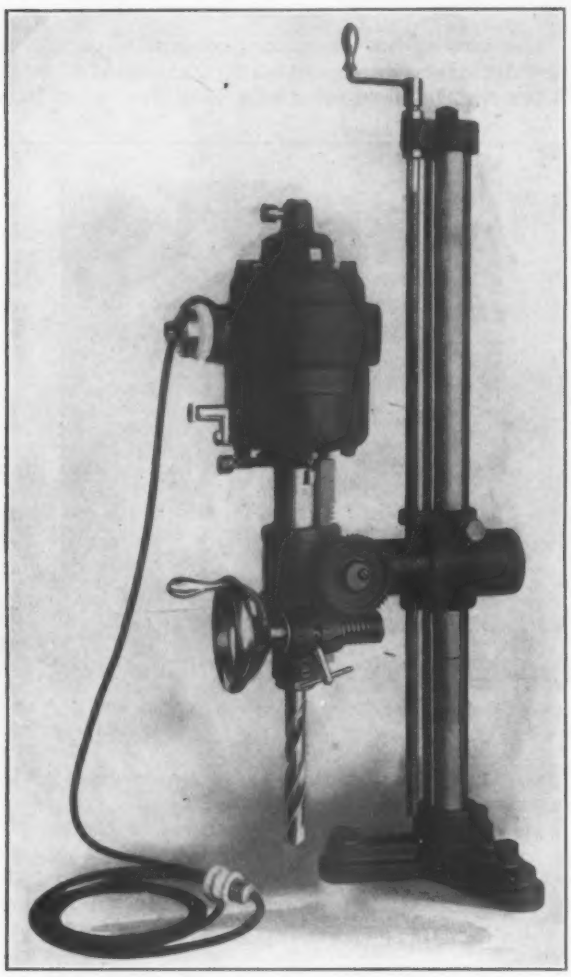
The Des Moines Bridge & Iron Works, Des Moines, Iowa, has been awarded the contract to furnish and erect the structural steel, 750 tons, for the Dakota Portland Cement Company's plant at Chamberlain, S. D. The Freeborn Engineering & Construction Company, Kansas City, Mo., is the engineer.

G. C. WILSON & SONS, Mechanical and Civil Engineers, PITTSBURGH, PA.

The Lamb Portable Electric Radial Drill

The Lamb Electric Company, 20 Huron street, Grand Rapids, Mich., has recently brought out a new portable electrically driven radial drill. This new tool is built of aluminum, phosphor bronze and drop forgings and will drill 1-in. holes in any position. It is driven by an electric motor, which can be supplied with current from a lamp socket. With two motors, one for alternating and the other for direct current, it can be used practically everywhere. The motor is integral with the spindle and the latter can be operated in any position. This tool can be furnished for either one or two speeds. In the latter type a two-speed gear change controlled by a small shifting knob is employed and speeds of 135 and 230 rev. per min. are instantly available.

The spindle is fitted with a No. 3 Morse taper and has a feed of 5 in. The main column is made of steel tubing



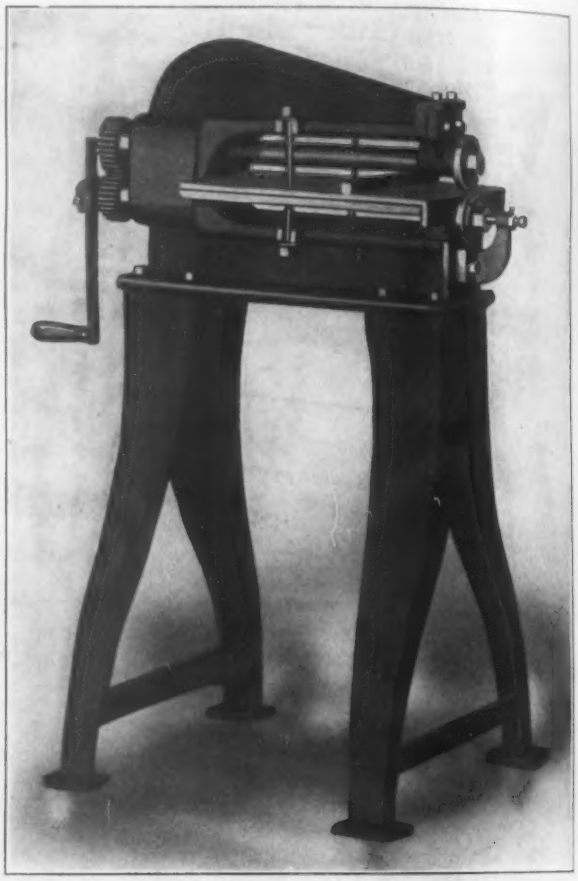
A New Portable Electric Radial Drill Made by the Lamb Electric Company, Grand Rapids, Mich.

and if desired can be lengthened at a slight additional cost. The net weight of this tool is 130 lb.

The Handy Slitting Shear

For handling all sorts of sheet metal work, the Indianapolis Elbow Company, 806 Fort Wayne avenue, Indianapolis, Ind., has brought out a new type of slitting shear. This tool will cut straight work of any length, will split a 30-in. sheet through the middle and cuts curved work, such as elbows, tees and other odd pieces to line. One of the special features of the shear is the steel bar crank, which can be readily adjusted to different lengths for light or heavy work.

The cutters used are of a special grade of steel, carefully tempered and ground after hardening. The cutters can be adjusted easily as well as the hight of the table in relation to them, and double scales on the table enable the gauge to be readily adjusted. The gears used have their teeth cut from the solid, which insures smooth running. Stay bolts are furnished for heavy work, and when these are used sheets as heavy as No. 16 gauge can be cut. Without the bolts the capacity is No. 20 gauge sheets. The throat depth of the shear is 16 in., which allows pieces 15 in. wide to be cut easily. The machine



The Handy Slitting Shear Made by the Indianapolis Elbow Company, Indianapolis, Ind.

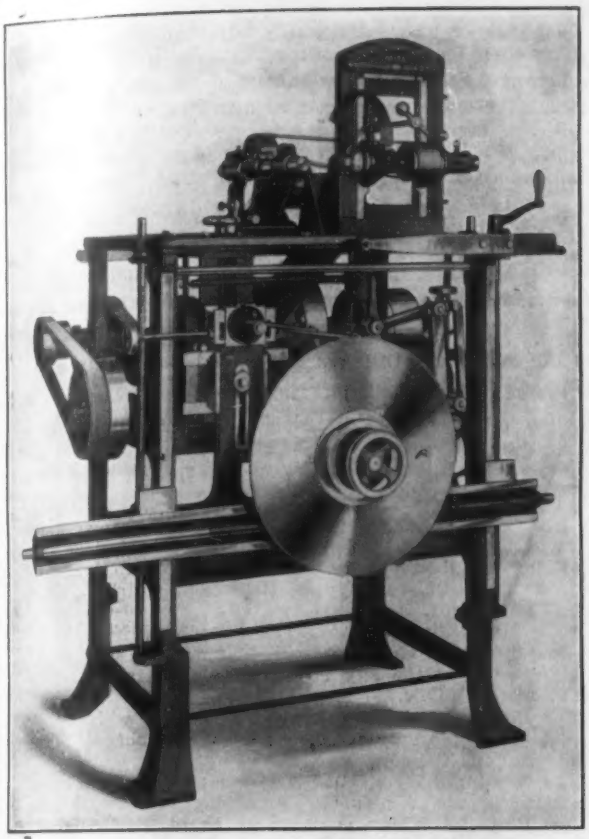
can be furnished with back gears for either hand or power operation, when very heavy work is to be handled at a slight additional cost.

The Covel Automatic Circular Metal Saw Sharpener

A new automatic machine for sharpening circular metal saws has been developed by the Covel Mfg. Company, Benton Harbor, Mich., and is being sold by E. C. Atkins & Co., Indianapolis, Ind., the general agents for this company's line of automatic filing room machinery. The sharpener has a number of improvements, among which are an angle shaped slide on the head, an improved adjusting crank to the gate screw, cut gears and a patented crosshead which enables the center of the saw to be adjusted to coincide with the grinding wheel center at all times. The special advantage of the machine is that it can retooth or punch heavy circular saws without retempering, which has heretofore been almost impossible.

This machine can be used to grind new teeth into saws where the old ones have been broken out and the work can be fed to the emery wheel with which the sharpener is equipped by an index plate. These plates are made with any number of teeth according to the saw which is to be sharpened or ground and gives a great advantage, as under the methods previously employed it has been well nigh impossible to retooth or punch heavy circular saws without retempering them.

All movements or adjustments of rods or connections are controlled by hand wheels and screws and can be adjusted while the machine is running. The maker's

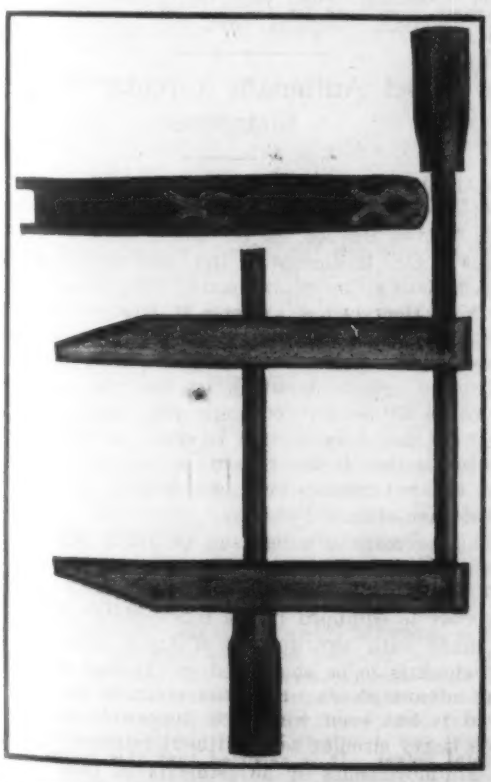


A New Automatic Sharpener for Circular Metal Saws Built by the Covel Mfg. Company, Benton Harbor, Mich.

new standard automatic belt tightening bracket also forms a part of the sharpener's equipment.

The Paramount Indestructible Steel Clamp

The Adell Bros. Mfg. Company, Orange, Mass., has recently brought out a new pressed steel clamp, known as the Paramount Indestructible clamp. It is made from sheet steel with a special inner strengthening nut to secure the greatest strength with the least metal. The clamps are designed for the use of machinists, toolmakers, car and boat builders, electricians and others having occasion to clamp together temporarily pieces of wood or parts of any kind.

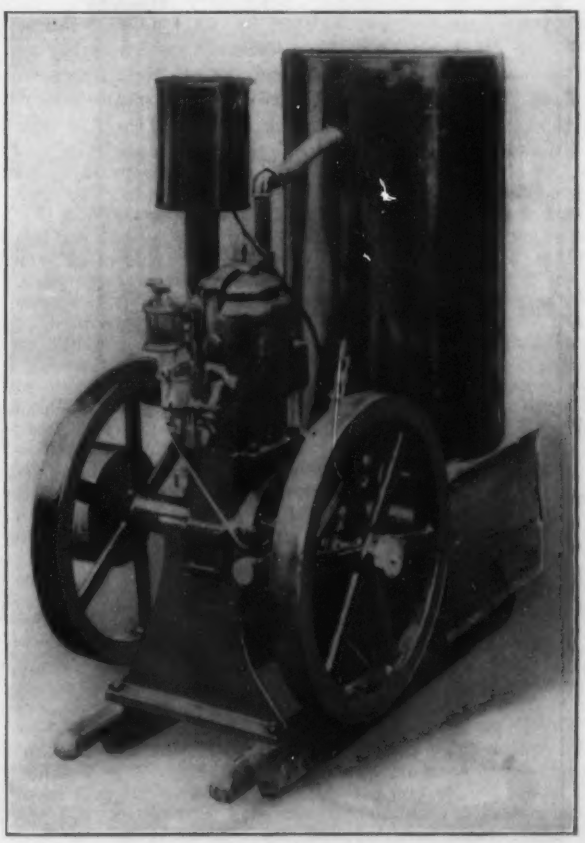


The Paramount Indestructible Pressed Steel Clamp Made by the Adell Bros. Mfg. Company, Orange, Mass.

The screws are long, and are said to give a durability which cannot be found in other clamps. A special modified type of United States standard thread is employed, which is fine enough to insure a powerful clamping action and at the same time gives a very smooth thread which is not apt to catch waste, dirt, &c. The nature of the material used insures exact duplication and uniform strength, while the method of construction eliminates sharp edges. Another special feature of the clamp is that glue when hard falls away from the smooth steel surface readily, thus eliminating the trouble frequently experienced. The standard sizes have 6-in. jaws with 4½-in. opening; 7⅝-in. jaws with 5½-in. opening, and 8¾-in. jaws with 6½-in. opening.

The Detroit Kerosene Engine

Kerosene as fuel in internal combustion engines has the advantages, as compared with gasoline, of costing 25 per cent. less and being capable of developing 25 per cent. more power per gallon. To enable users of stationary engines to secure the advantages of this form of liquid fuel, the Detroit Engine Works, Detroit, Mich., has placed on the market a stationary engine which will operate on gasoline, distillate, naphtha, alcohol, kerosene or mixtures of any of them, although the most satisfactory operation is secured with kerosene as fuel.



A Stationary Kerosene Engine Built by the Detroit Engine Works, Detroit, Mich.

The construction of the Detroit engine is very simple, no cams, gears or sprockets being employed. There are only three moving parts and but one adjustment is required. The engine is of the two-cycle type and can be started easily as it does not require cranking. The speed can be varied from 100 to 1000 rev. per min. and reversed if desired. The engine is mounted on skids and can be carried from place to place wherever work has to be done, often saving considerable time. On account of its simple construction the engine is unusually free from repairs. Six sizes of the engine are built, ranging from 2 to 8 hp.

The Machinery Markets

Railroads are taking more interest in their machinery requirements in Chicago, where two more small lists are out. Reports are received of renewed activity in the automobile industry in the West. The machinery trade in New York is figuring on two good lists of tools for Japanese consumption, and New England is getting considerable business from abroad. The demand in Philadelphia and Baltimore is irregular for standard equipment, although a good business is being done in special machinery. Electrical machinery and equipment for traction enterprises have the call in Cleveland just now, where considerable new construction work and power plants are being undertaken. The indications of good crops and the prospects of the settlement of the Mexican disturbances are having a good influence on the machinery trade in Texas and the Southwest. In other sections of the country business is rather quiet, with little of marked importance to report except on the north Pacific Coast, where the movement of mining machinery and supplies to Alaska is unusually heavy and numerous orders are coming out for stamp mills, &c.

New York

NEW YORK, April 5, 1911.

Inquiries and orders are coming into the New York machinery market in better volume than at any time in the last three weeks. Sevefal good deals have been closed, and some large inquiries, particularly for machine tools, came out. The American Bank Note Company, which is buying for its large new plant at Hunter's Point, N. Y., was an excellent customer, and its inquiries indicate that there is more business to come from that source. Two fine lists of machine tools for export to Japan have made their appearance. These lists are sent out by two different Japanese engineering firms, and one of them calls for about $10,000 worth of equipment, while the other is somewhat smaller. The larger list, it is understood, is not to be closed for two months. Houses that make a specialty of buying machinery for the European trade are also inquiring for machine tools, and the general export business is better than it has been at any time within the last 12 months. It is believed that the Baltimore & Ohio Railroad will shortly issue a list, as machinery men who are familiar with the affairs of that company state that data are being collected by its mechanical force with a view to making heavy purchases of machine tools and blacksmithing equipment. For the last two years the company has been contemplating the erection of machine shops at Cumberland, and plans prepared for this improvement call for an expenditure of $500,000. It is probable that the company has decided to go ahead with the enterprise, and it is expected that a list will be out before many days. Second-hand machine tools are bringing unusually good prices, and some large sales of rebuilt machinery were made during the week. The demand for used mechanical equipment increased noticeably within the last few days, and the pleasing feature is that the inquiries are new and the sales are not the result of people asking for bids on new tools and compromising on second-hand machinery.

The Drum Elevator Company, 103 Walker street, New York, will require considerable equipment for a new plant it proposes to erect on Sand street, Brooklyn. The building will be six stories and basement, 20 x 100 ft. It will be of brick and mill construction and will cost about $25,000. When the plant is completed the equipment in the New York factory will be moved there and more will be added. The machinery details have not been perfected as yet, and the company has not decided whether it will use electric or steam power.

The Rector Gas Lamp Company, 131 West Thirty-first street, New York, has purchased a building at Scranton, Pa., formerly used by the Lackawanna Iron & Steel Company as a storage building. The lot is 80 x 160 ft., and a two-story brick building now on it will be improved and used for manufacturing brass parts for gas lamps. The company's manufacturing equipment in the New York building will be moved to Scranton in time to commence manufacturing operations May 1. George A. Updyke is president.

The Hatfield Mfg. Company, maker of auto trucks, has moved its plant from Cornwall, N. Y., to Elmira. W. N. Taylor, who was formerly connected with the Pope-Toledo Company, is general manager of the Hatfield Company, and will have charge of the manufacturing details. The company will install some new equipment, including power apparatus, and may use some electric motors. Inquiries have been made in the New York market for a line of machine tools. Mr. Taylor has charge of the purchasing details.

The Department of Water Supply, Gas and Electricity, New York, Henry S. Thompson, Commissioner, will receive bids until April 12 for furnishing and installing a boiler plant complete and a pumping plant complete in the pumping station, to be erected at Whitestone, N. Y., and for furnishing and erecting a pumping station near the existing driven well plant at Whitestone. Bids are to include the furnishing of all labor and material required to complete the contract abandoned by the Robertson, Gearhart Construction Company.

The Destructor Company, 111 Broadway, New York, was low bidder for the three-grate, 40-ton refuse destructor, to be installed at the city utilization plant, Hamburg and Scott streets, Buffalo.

The International Time Recording Company will build a 50 x 200 ft., three-story reinforced concrete factory addition to its plant at Endicott, N. Y.

The Newburgh Light, Heat & Power Company will build and equip a power plant at Balmville, near Newburgh, N. Y. Plans have been prepared by Frank E. Estabrook, engineer.

It is understood that the Ontario Button Company will move from Amsterdam, N. Y., to Utica, where it will establish its manufacturing plant at Third and Utica streets. Chas. A. Byington is president, and E. G. Dennison secretary and manager.

The Rochester Railway & Light Company, Rochester, N. Y., has given the contract for the construction of its power plant No. 6, and work has been commenced.

The Hemmingway Canning Company, Lyons, N. Y., has purchased and will refit and equip the former plant of the Lyons Beet Sugar Refining Company at that place for use as a canning factory.

The H. N. Thayer Company, manufacturer of baby carriages, is adding a three-story, 84 x 108 ft., building to its factory.

The Lake Erie Foundry Company, Erie, Pa., has let contract for a two-story addition, 50 x 100 ft., to be made to its plant, and work has been commenced.

Contracts have been let for the construction of a one-story factory building, which the Loetz-Tuscher Company, Utica, N. Y., will erect.

The Hammermill Paper Company has awarded the contract for the erection of the extensive addition it will make to its plant at Erie, Pa., to the Pittsburgh Bridge & Iron Company; about 1500 tons of structural steel will be required.

The Allied Safety Devices Company has been incorporated at Buffalo for the manufacture of various safety devices for woodworking and ironworking machinery, and will take over and continue the business of the George B. Nye Company, manufacturer of woodworking machinery and safety devices. The plant and office of the company will be located at 45 Henry street. George B. Nye is manager.

Chicago

CHICAGO, ILL., April 4, 1911.

The local machinery market is somewhat quieter than last week, although sufficient business has been turned in most machinery houses to bring the total for March business well above that of February. There are several lists of second-hand machine tools being offered in this market by automobile concerns from various parts of the country. The largest offer of this kind totaling $20,000 comes from a factory in the Detroit district. Although the automobile business is improving in some quarters, lists of this kind in many instances including some new tools are not encouraging, and show slow recovery from the recent set back given this industry. Following last week's list, which was for Butler, Wis., shops, the Chicago & Northwestern Railroad is out with new requirements for the Boone, Iowa, shops which total $6000. It is reported that this railroad company will follow shortly with a third list, and that purchases of the material mentioned in the three inquiries will be made at the same time. Further activity in railroad

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buying is evidenced by the new Santa Fe list approximating $10,000. The fact that railroads are buying more freely has lent a better tone to this market and a general impression prevails that as the season advances this buying movement will strengthen. Floor sales from city shops and small manufacturers in this immediate vicinity are increasing, and in many instances distributers report that branch of business up to normal. Trade emanating from heavier sources has, however, been somewhat inclined to drag since the first of the year.

The Chicago Pump Company, Chicago, manufacturer of electrical pumping machinery, has increased its capital stock from $10,000 to $25,000, additional capital being necessary to take care of its rapidly growing business.

John C. Kristan, 1027 Milwaukee avenue, Chicago, has purchased the property at the northwest corner of Elston avenue and Augusta street and will erect a building, three stories and basement, to be equipped with improved baking machinery. All equipment with the exception of conveyors and boiler has been purchased. P. M. Hyde, 226 Lasalle street, is the architect.

The Alton Gas & Electric Company, Alton, Ill., has increased its capital stock from $500,000 to $600,000, but states that it is not contemplating any improvements at the present time.

The Farmington Light & Power Company, Farmington, Ill., recently incorporated with $30,000 capital stock, will take over the property of the Farmington Electric Light Company and extend its service to London Mills, Rapatee and Middle Grove, Ill.

The business of the Miller Safety Lock Company, Peoria, Ill., has been incorporated with $2400 capital stock. The company manufactures automatic car and door safety locks for the prevention of accidents on passenger elevators.

A special election will be held by Roland, Iowa, April 18, to vote upon the issuance of bonds in the sum of $8000 for the construction of a light plant and $10,000 for a water works system.

The Marshalltown Motor Material Mfg. Company, Marshalltown, Iowa, recently incorporated with $10,000 capital stock, states that it has rented a factory which it will use for the present.

The Fort Dodge Culvert Company, Fort Dodge, Iowa, manufacturer of corrugated metal culverts, arches, well curbing, &c., will increase its capital stock from $10,000 to $50,000. The company has recently expanded its plant facilities by the installation of several presses, special riveting machines and rolls. A squaring sheer and a set of rolls and dies for making galvanized fence posts will probably be purchased in the near future.

Dodge Bros., formerly of Joliet, Ill., have purchased a site in Keokuk, Iowa, and removed their machinery for the manufacture of indestructible automobile tires to that city.

The farmers in the vicinity of Carroll, Iowa, have organized a company to be known as the Farmers' Grain & Lumber Company, with a capital stock of $20,000, and will erect an elevator.

Headford Brothers, Waterloo, Iowa, foundrymen, are contemplating erecting an addition, owing to the rapid increase in their business, notwithstanding their facilities have only recently been greatly enlarged.

The Peoria Washed Sand & Gravel Company, Peoria, Ill., has increased its capital stock from $5000 to $25,000.

The Harrison Machine Works, Belleville, Ill., has issued orders for the resumption of a nine-hour day in all departments of the plant. An increase of business has rendered it necessary to run on longer hours. The Belleville foundry interests employ upward of 2000 men, and are now working full time, with plenty of orders ahead.

The Automatic Safety Appliance Company, La Salle, Ill., has been incorporated with a capital stock of $100,000. The incorporators are A. G. Huling, Thomas Baird and W. H. Fraser.

A new corporation, known as the Hollow Brick & Tile Company, has been chartered and will operate in West Salem, Ill., with a capital stock of $50,000. The president is Wm. Harrison; vice-president, W. O. Mallinson; secretary and treasurer, Paul Grace.

The Woodhull Grain Elevator Company, Woodhull, Ill., has been incorporated with a capital stock of $7000. The incorporators are Jay L. Carnes, A. D. Richards and A. N. Johnson.

Philadelphia

PHILADELPHIA, PA., April 3, 1911.

While the closing week of March has shown a slight improvement in the demand for machinery, tools and equipment, the volume of the month's business has been rather disappointing to the trade. Little business of individual magnitude has been transacted, the general run of sales being small. Railroad business has been particularly light; inquiries have been few and those that have come out close up very slowly. Competition for business of almost every character has been growing sharper, merchants being particularly anxious for orders, and in a number of instances prices have suffered. The past week a few orders for heavy tools have been placed, and at least one fair sized prospect for a moderate shop equipment has developed. As a rule, however, the demand is confined to single tools for prompt shipment, and as stocks on hand cover a pretty fair range, the requirements can be pretty generally met. Special tool builders have booked a few orders, and in several instances it has been this class of business that has enabled builders to keep plants in operation at recent capacities. In second-hand tools conditions follow largely those of the general market. There is a moderate inquiry for various equipments, but sales are irregular. Foundries are a trifle better engaged, particularly steel casting plants, but gray iron foundries, depending to some extent on the machine tool trade for work, note little betterment in the demand for that class of castings. The market for boilers and engines is somewhat broader, as is usually the case at this season when spring building opens up. Several moderate power propositions are in sight and a betterment in this line is anticipated.

Alexander Brothers, manufacturers of leather belting, are going ahead with proposed plans for the increasing of their plant facilities. A contract has been placed with G. F. Pawling & Co. for a structural steel, brick and concrete building, for general manufacturing purposes, 71 ft. 9 in. x 178 ft. 5 in., extending from 414-416 North Fourth street through to Orianna street. Plans are being considered for the enlarging of the power plant, the equipment required for which will probably be such as will double the present capacity.

The A. F. Bornot & Brother Company is considering the erection of a garage on North street, above Sixteenth street, from plans by Werner Trumbower. The structure is to be brick and concrete, 50 x 90 ft., two stories.

The Hohlfeld Mfg. Company, Eight and Dauphin streets, has broken ground for a large manufacturing plant to be located at Tenth street and Sedgley avenue, to which it will remove on completion. There will be a group of three buildings. The main manufacturing building, which at present is to be three stories, will have provisions for two additional stories. This building will be 62 x 250 ft. The power house will be of the one-story type, 24 x 104 ft. A one-story storage building, 21 x 116 ft., will also be erected. Both steam and electric power plants are under consideration, but have not yet been decided upon.

The Pennsylvania Equipment Company, West End Building, is in the market for a number of new body 60,000-lb. box cars, 8 ft. 6 in. x 36 ft. and 8 ft. high, equipped with Tower M. C. B. couplers, Westinghouse air brakes and hand brakes, diamond frame, arch bar, rigid trucks; several modern vestibule passenger cars, not less than 70 ft. long; several new body cabooses, 36 ft. long, and a number of 80,000-lb. capacity gondola cars, with bottom dump.

The Lehigh Valley Railroad Company has been receiving bids for the erection of a brick and steel car repair shop, one and two stories, to be erected at Coxton, Pa. The proposed structures are understood to embrace a roundhouse and general shop buildings.

Fretz, Gross & Co., manufacturers of umbrella hardware, 1015 Diamond street, have acquired property at Twenty-sixth street and Sedgley avenue and will erect a manufacturing plant, which they will occupy on completion. Plans have been completed for a one-story concrete factory, which will give them 70,000 sq. ft. of floor space. The plant will be equipped with the necessary machinery for the manufacture of umbrella tubing and hardware. Much of the machinery, being of special nature, will be built in their own shop. A complete machine shop is to be installed in the new plant, but the exact nature of the equipment has not yet been decided upon.

The borough of Chambersburg, Pa., will take bids until April 7 for work in connection with its water works, consisting of a diversion of a dam, a reservoir of 2,200,000-gal. capacity and a stand pipe, 10 ft. in diameter and 40 ft. high. John Birkinbine, Parkway Building, Philadelphia, is the engineer, from whom plans and specifications may be secured. The borough will also receive bids until April 10 for a sewage disposal plant and sewer system. This work consists of a filtering plant, including pumping plant and filter beds and 85,000 ft. of terra cotta pipe. Albright & Mebus, Land Title Building, Philadelphia, are the engineers in connection with the latter work, and from whom plans may be obtained. C. O. Wood, Chambersburg, is chairman of the Water Works Committee, and S. K. Syrock, Chambersburg, is chairman of the Sewage Plant Committee.

It is stated that a company, to be known as the Ephrata & Lebanon Railroad Company, was decided upon at a meet-

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ing held at Schaefferstown, Pa., which will build and operate an electric railway between Ephrata, Pa., and Lebanon, passing through Clay, Hopeland, Klinefeldtersville, Schaefferstown and Riestville, Pa., a distance of 23 miles. The right of way has been secured, and it is understood that the company will formally organize and begin the work of building the road at a very early date.

The York Bridge Company reports business in the highway bridge line as very encouraging. It is rushed in its estimating department and constantly receiving inquiries for bridge and structural work. This company has recently opened an office in the Milwain Building, Albany, N. Y. Among recent orders taken may be mentioned two bridges from the Hershey Improvement Company, Hershey, Pa.; steel floor beams and joists for two 90-ft. spans at Clarksburg, W. Va., and a 16 x 62 ft. heavy highway bridge for the town of Croghan, N. Y. Work will also be shortly started on a new bridge to span the Susquehanna River at Sunbury, known as the Packers Island Bridge, and consisting of six spans, 22 x 154 ft., of heavy highway construction. The company also has the contract for an eight span bridge to be shipped to Brazil. Considerable work for the Pennsylvania Water & Power Company at McCalls Ferry is also in course of erection, while orders for several new buildings for Otto Eisenlohr, Lancaster, Pa., have also been booked.

New England

BOSTON, MASS., April 4, 1911.

Some of the important houses manufacturing sensitive drilling machines have advanced their prices 5 per cent. The movement is understood not to be universal, but probably a very large per cent. of spindles manufactured in this country are affected. This branch of the trade has felt for some time that its prices were too low, considering the great improvements which have been effected, by which customers receive a greater value that formerly.

The machine tool business in general is responding but slowly to the spring influence, according to the dealers. The builders are experiencing some improvement through the better business in the Middle West and through orders from abroad.

The great group of New England industries, of which the typewriter is entirely typical, are very busy. This is an excellent gauge of the general prosperity of the country. In Connecticut the typewriter people are rushed with orders. Some factories are not producing up to current orders, and will be compelled to increase their manufacturing facilities, and, in fact, are already doing so by the purchase of new equipment. The Royal Typewriter Company, Hartford, proposes to increase its plant and double its capacity.

The silverware industry is another striking proof of this general condition. As a whole the plants of Connecticut and Rhode Island enjoyed an unusually prosperous year in 1910, and the condition has not changed for the worse since the New Year. The International Silver Company, Meriden, Conn., did the largest business in its history, with the exception of 1909, the net earnings being equivalent to 24 per cent. on the capital stock of $6,000,000.

The brass manufacturers of the Naugatuck Valley are normally busy. The demand has increased somewhat since the first of the year. Recently large orders for rods and tubes have been booked. The mills could produce more, but still they are comfortably active, taking the situation as a whole. The manufacturers who cut up brass in their factories are fairly busy, and some of them are rushed to the limits of their manufacturing resources. The builders of machinery which goes into the brass mills and factories are doing a normal business. One of the largest concerns of the kind in the world found last year nearly equal to all previous records. Foreign business in this branch of the machinery trade is fairly good. In New Britain the hardware manufacturers are doing a good business, without being rushed with orders.

The widespread agitation following the disastrous factory fire in New York will stimulate business to some extent. Everywhere the authorities are finding factory buildings which are inadequately guarded against risk to employees in case of fire or panic, and a much more rigid insistence upon the carrying out of the provisions of existing laws, and widespread movements for better codes of regulations, are working toward improvements which will cost in the aggregate millions of dollars. Manufacturers and dealers in everything that will be required in remedying present conditions are alert to the situation, and should do a large business before the movement breaks down through the inevitable lack of interest which will follow after a time.

The labor situation could not well be quieter. A few insignificant strikes are on, chiefly outside of the metal lines, and little of the threatening talk usually heard at this season is reported. The great branches of the metal working fraternity appear to have no special grievances against their employers. There is nothing to indicate that the machinists will give trouble in any of the machinery centers, nor is there unrest in the foundries or boiler shops, excepting that the Boston & Albany Railroad is feeling the effects of sympathetic action on the part of its boiler makers.

The Veeder Mfg. Company, Hartford, Conn., manufacturer of cyclometers, odometers, tachometers, tachidometers and speed counters, will erect a three-story addition to its plant, 40 x 72 ft., three stories and basement.

The Gilbert & Bennett Mfg. Company, Georgetown, Conn., wire manufacturer, is erecting two galvanizing buildings, one 41 x 114 ft., the other 14 x 26 ft.

The Yale Iron & Stair Company has been organized to establish works at West Haven, Conn., and carry on a business similar to that of the Yale Safe & Iron Company, which recently went into bankruptcy. William Grossley, formerly connected with the old company, is the president and treasurer of the new corporation. A new factory will be erected, equipped with modern machinery. The business of the Yale Safe & Iron Company has been wound up by the receiver, Frederick Farnsworth, head of the McLagon Foundry, New Haven.

The Rhode Island Branch, National Metal Trades Association, has organized for the year with the election of these officers: President E. A. Beaman, Beaman & Smith Company, Providence; vice-president, A. J. Thornley, Narragansett Machine Company, Pawtucket; treasurer, John G. Aldrich, New England Butt Company, Providence; secretary, Joseph A. Holland; Executive Committee: James Morpeth, Brown & Sharpe Mfg. Company, Providence; William Tether, Maxwell-Briscoe Motor Company, Providence; H. L. Scott, H. L. Scott & Co., Providence; J. E. Osgood, J. M. Carpenter Tap & Die Company, Pawtucket.

The Standard Brass & Copper Tube Company, New London, Conn., has increased its capital stock from $50,000 to $75,000, the purpose being to increase the plant.

Terrill & Rogers, Boston, Mass., has moved its headquarters from 153 Milk street to 12 Pearl street. The firm represents manufacturers of twisted steel bars, soft steel and iron bars, hammered forgings, filled columns, tubes, plates, sheets, kerosene torches oil furnaces, &c. The firm consists of B. B. Terrill and P. C. Rogers.

The machinery division of the Blake & Johnson Company, Waterbury, Conn., is busily engaged in redesigning its whole line, and has already brought out an improved cold rolling mill designed to meet the increased demand of manufacturers of cold rolled steel, flat wire, copper, brass and other metals. The mill is in two sizes, 8 and 10 in. The company has also added to its line a redesigned thread rolling machine, having a capacity of 7-16 in. diameter, with threads up to 4-in. length. The machine is designed to take dies having and face up to 4 in., the standard size furnished being 2 in. The process of redesigning the line is going on through the wire mills, rivet machines, presses and subpresses, gang slitters and grinders. L. P. Clark is the manager of the machinery department.

The Waterbury Farrel Foundry & Machine Company, Waterbury, Conn., has brought out a new double acting cam pillar press, known as the Special No. 8, which is designed for heavy cutting, forming and drawing. It has a capacity of drawing or cupping steel shells 4 in. in diameter, ⅛ in. thick and 2 in. deep.

Additions to general manufacturing plants of New England just announced include the following: Bradford Dyers' Association, Bradford, England, mill building at Niantic, R. I., 290 x 380 ft., one story, of heavy mill construction, Richard P. Jenks, 735 Banigan Building, Providence, R. I., engineer in charge; H. E. Bartlett, Leominster, Mass., toys, factory, 60 x 100 ft., two stories, to replace factory recently destroyed by fire; Westerly Jewelry Company, West Mystic, Conn., one-story brick factory; W. A. White, Hartford, Conn., factory building to be occupied by the Eastern Chemical Company; Wachusett Thread Company, Worcester, Mass., factory, 124 x 313 ft., four stories; J. D. Bergen Company, Meriden, Conn., cut glass, branch plant at St. Louis, Mo.; Providence Braid Company, Providence, R. I., three-story mill, 50 x 180 ft., and three stories, 25 ft., addition to present mill.

Cleveland

CLEVELAND, OHIO, April 4, 1911.

Business with machine tool dealers has improved slightly. Both orders and inquiries are somewhat more plentiful. While no large inquiries are coming out, there is a better demand for lots of three or four tools. During the previous few weeks there was very little demand for more than single tools. Practically all of the business is still coming from

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small concerns. The demand for second-hand tools is more active.

There is a decided improvement in the demand for electrical equipment, particularly from traction companies for extensions to their power plants. These companies have bought very little new equipment during the past year or more. Specifications for the new $2,000,000 plant to be built at Cuyahoga Falls, Ohio, by the Northern Ohio Traction & Light Company are expected to be out shortly, and considerable other business from traction companies is in prospect. Considerable new construction work in power plants for industrial companies is also in prospect, indicating an early increase in the demand for engines and boilers.

Cleveland interests will build a large lighting and power plant in Fort Worth, Texas, the equipment for which will be purchased shortly. This will include eight 500-hp. boilers, two 4000-kw. turbine generating units with accompanying equipment. Plans have been prepared by the Cleveland Construction Company, 606 Citizens Building, engineer in charge, which will place the orders for the equipment.

The Erie City Iron Works, Erie, Pa., will enlarge its plant by the erection of an up-to-date foundry, 250 x 600 ft., and a pattern storage house. Plans for the plant have been prepared, but it has not been decided when to start the construction, which may be delayed for a time. The plant has been enlarged by the recent completion of a brick stack and tank shop, 100 x 200 ft., equipped with the necessary cranes for handling material. The company reports a very good volume of orders for both engines and boilers, and its shops are well filled with work for some time ahead.

The Williams Edwards Company, wholesale grocer, Cleveland, will shortly place orders for power equipment for its new building now under construction. The specifications include two 200-hp. water tube boilers, two generating units and complete electric and elevator equipment.

The Cleveland Worsted Mills Company is building an addition to its power plant at its Odsonia mills at Falconer, N. Y. Orders have been placed for two 400-hp. Sterling water tube boilers and two Detroit automatic stokers.

The Detroit Stoker Company, Detroit, Mich., through its Cleveland office, has received an order from the American Locomotive Company for three Detroit automatic stokers to be installed at its Allegheny plant in connection with three 300-hp. Wickes vertical boilers.

The Cleveland, Painesville & Eastern Railroad will enlarge its power plant at Willoughby, Ohio. Two 400-hp. boilers and electrical equipment will be purchased.

The Burke Electric Company, Erie, Pa., builder of motors, has just completed an addition to its plant, 50 x 338 ft., of brick, one story. This addition will be used for the storage of finished parts, and the assembling, testing and finishing departments. This addition with other extensions made by the company during the past year provides more than double the former capacity.

The W. H. Mullins Company, Salem, Ohio, has commenced the erection of a large four-story addition to its plant, having a street frontage of 150 ft. The building will be of steel construction. The first two floors will be occupied by offices, and the remainder of the building will be used for the assembling of automobile parts.

The city of Toledo, Ohio, will shortly place a contract for a bascule lift to be erected in connection with the new Cherry street bridge in that city. Plans submitted by the Strobel Steel Bridge Construction Company, Chicago, have been accepted. The estimated cost of the lift is about $140,000.

The Ohio Valley Brass & Iron Company, in which several Cleveland men are interested, has been organized to establish a plant at Wellsburg, W. Va., for the manufacture of plumbing goods and steam specialties. The company has a capital stock of $75,000.

The Stewart Tank & Mfg. Company, Cleveland, Ohio, has been organized with a capital stock of $25,000 to manufacture water closet seats and tanks.

The Enamel Vitrified Brick Company, Toledo, Ohio, has been incorporated with a capital stock of $200,000 to place on the market a brick made by a new process. It is stated that several plants will be erected in various sections of the country. William Urschel is president and J. J. Urschel, manager.

The Electric Furnace Company, Alliance, Ohio, has been incorporated with a capital stock of $20,000 by T. F. Bailey and others.

The Bieder Mfg. Company has reopened its plant in Ashtabula, Ohio, where washing machines, vacuum cleaners and other products will be made. The plant was recently closed when the company removed the manufacture of its gas engines to Erie, Pa.

The Dayton Auto Top Mfg. Company, Dayton, Ohio, has been incorporated by L. B. Kline and others to manufacture automobile tops. The company will be located at First and St. Clair streets.

The Union Clay Products Company, Akron, Ohio, has under consideration the erection of a plant at St. Joseph, Mo., for the manufacture of building and paving brick and sewer pipe. All matters regarding the proposition are in the hands of Matthew Lang, Akron, Ohio.

Cincinnati

CINCINNATI, OHIO, April 4, 1911.

It is reported from a source that is considered reliable that the automobile manufacturers in the West are preparing for a more active period. Several of them are understood to be making quiet inquiries for skilled labor. If this report is correct, it will undoubtedly tend to improve the machine tool business. The railroads continue their policy of only purchasing such tools as they are in urgent need of, and the absence of any extensive lists indicates that this policy will probably be continued for some time yet.

Business with the jobbing foundries shows signs of slackening up, but there is no appreciable diminution in the melt so far. Second-hand machinery is only moving moderately well.

The Split Fiber Keg Mfg. Company is a new incorporation at Cincinnati, with $30,000 capital stock. The company intends to manufacture a patented split-fiber keg for holding paint and white lead, but quarters for the new factory have not yet been selected. Otway Yeazell is president and treasurer, and Max J. Schumann is secretary. Other incorporators are Raymond A. Yeazell, Basel Autal, Peter Fabian and Dennis J. Ryan.

The Thomas Mfg. Company, Springfield, Ohio, maker of farm implements, &c., has plans under way for enlarging its foundry.

The Foos Gas Engine Company, Springfield, Ohio, has shipped two 300-hp., 3-cylinder gas engines to Kenilworth, W. Va., to be used in operating the gates of the large dam recently constructed at that point by the Government.

There is a freely circulated report to the effect that the Baltimore & Ohio Railroad Company's repair shops, now located in Sandusky, Ohio, will be removed to Toledo some time in the present year.

The Carborundum Company, Niagara Falls, N. Y., will soon open a branch salesroom at 308-310 Main street, Cincinnati. This will be used for handling more expeditiously the Ohio and Kentucky territory.

The Knabe Brothers Company, Cincinnati, is a new incorporation with $450,000 capital stock, and has acquired the piano factory of the Smith & Nixon Piano Company in Norwood suburb. Among improvements contemplated is the installation of a sprinkler system. E. J. Knabe, Jr., and William Knabe are among the principal incorporators.

The Blair Motor Company has been incorporated at Cincinnati, with $25,000 capital stock, by John A. Deasy, P. F. Habercorn, John H. Monahan, J. W. Creaman and Edward H. Bourk. It is the announced intention of the company's officials to make a patented chainless motor truck, but no manufacturing arrangements have yet been decided on. John A. Deasy's office is in the Fourth National Bank Building.

The Ohio, Indiana & Kentucky Heater Company is a new Cincinnati incorporation, with $10,000 capital stock. Manufacturing quarters have been leased in the rear of the building at 209 to 215 East Sixth street, and operations will commence so soon as the necessary equipment can be installed. Practically all machinery, which is of a special character, has been contracted for. The new company will manufacture a patented gas furnace. Officers have not yet been selected, but A. J. English, of Cincinnati, is named as one of the principal promotors.

Littleford Brothers, Cincinnati, manufacturers of boilers and tanks, have acquired an additional site adjoining their plant, but have no plans for any immediate additions to their factory.

The Laidlaw-Dunn-Gordon Company's Cincinnati plant is shipping two 8,000,000-gal. cross compound Corliss pumping engines to the Coronet Phosphate Company, Lockland, Fla.

A supplementary report made last week by J. M. Manley, secretary of the Cincinnati Branch, National Metal Trades Association, raises the average of operating activity of plants in this vicinity from 90 per cent., as given in the report of March 15, to 91 per cent., which is the same shown for the quarter ending December 15.

The Samuel C. Tatum Company, Cincinnati, manufacturer of office and hardware specialties, has discontinued the operation of its foundry at John and Water streets, and hereafter all its manufacturing will be done at the Colerain avenue plant. However, some of its foundry business will be let out under special contracts with outside firms.

It is rumored that several new lumber and woodworking plants will be established in Cincinnati at an early date.

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The Crook-Kries Company has taken a number of moderate orders for general heating and ventilating work, both in this city and Washington, D. C., and is estimating on considerable new business. A contract was recently taken to equip the residence of George Blackiston, Sherwood, Md., with a steam heating plant, pumping apparatus and a vacuum cleaning system, under the direction of J. P. Burnett, engineer. Extensive alterations to the power plant of the Belvidere Hotel are also being made by this company.

The Cumberland Valley Railroad is reported to be preparing plans for extensive improvements in Chambersburg, Pa. The plan includes, it is said, the construction of a roundhouse, freight yards and passenger station, new terminals and the elevation of its railroad tracks in that city, the streets of whoch are to be crossed on bridges. G. C. Koons, Chambersburg, Pa., is the company's engineer.

The Chesapeake Iron Works is quite busy estimating on new work, but is not very actively engaged in its operating department. Recent inquiry has been largely confined to small work, although bids have just gone in on an 800-ton job for the new Hamilton Hotel, Washington, D. C. Among orders taken was one for the ornamental and structural material for the new Western High School Building, Washington, D. C. From present indications it is believed that the demand for structural and ornamental iron will improve in the near future.

As an outcome of a hearing of prominent shippers of commodities in this city before the Public Service Commission recently, regarding the alleged excessive switching charges by the railroads, which were fixed at a rate of 5 cents per 100 lb., it is stated that the officials of the Pennsylvania and the Baltimore & Ohio railroads have tentatively agreed upon a charge of 1 cent per 100 lb. as their rate for this service. Producers located on either road will have a more equable freight rate under this basis.

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It is announced that the Baltimore & Ohio Railroad Company has awarded a contract to Edward Brady & Son for the erection of a cold storage plant on Sharp street, between Lee and Hill streets. The building, 54 x 350 ft., is to be of brick and concrete. It is also stated that the work of rebuilding and enlarging the roundhouse and shops at Cumberland, Md., will be begun at an early date.

Suchting & Son have awarded the contract for a three-story addition, 46 x 131 ft., to be built to their box factory at 613-615 West Pratt street to F. C. Carstens. The building will be used as a factory and warehouse. They are not yet prepared to figure on equipment for the new factory, but state that in the near future they will consider additional power equipment for the present plant.

The Crook-Kries Company has taken a number of moderate orders for general heating and ventilating work, both in this city and Washington, D. C., and is estimating on considerable new business. A contract was recently taken to equip the residence of George Blackiston, Sherwood, Md., with a steam heating plant, pumping apparatus and a vacuum cleaning system, under the direction of J. P. Burnett, engineer. Extensive alterations to the power plant of the Belvidere Hotel are also being made by this company.

The Cumberland Valley Railroad is reported to be preparing plans for extensive improvements in Chambersburg, Pa. The plan includes, it is said, the construction of a roundhouse, freight yards and passenger station, new terminals and the elevation of its railroad tracks in that city, the streets of whoch are to be crossed on bridges. G. C. Koons, Chambersburg, Pa., is the company's engineer.

The Chesapeake Iron Works is quite busy estimating on new work, but is not very actively engaged in its operating department. Recent inquiry has been largely confined to small work, although bids have just gone in on an 800-ton job for the new Hamilton Hotel, Washington, D. C. Among orders taken was one for the ornamental and structural material for the new Western High School Building, Washington, D. C. From present indications it is believed that the demand for structural and ornamental iron will improve in the near future.

As an outcome of a hearing of prominent shippers of commodities in this city before the Public Service Commission recently, regarding the alleged excessive switching charges by the railroads, which were fixed at a rate of 5 cents per 100 lb., it is stated that the officials of the Pennsylvania and the Baltimore & Ohio railroads have tentatively agreed upon a charge of 1 cent per 100 lb. as their rate for this service. Producers located on either road will have a more equable freight rate under this basis.

Work has begun on the first section of the new Baltimore Bargain House, for which the Noel Construction Company has the general contract. Plans were prepared by Joseph Evans Sperry, architect, and call for a 12-story structure,

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94 x 167 ft., of steel frame, brick and stone construction. The structural steel work, embracing 2400 tons, will be furnished and erected by Dietrich Brothers. The building will be equipped with a number of freight and passenger elevators and modern mechanical means for conveying merchandise from one portion to another. The work of demolishing present buildings on the site of the new one has already begun.

Plans have been prepared by the harbor engineer of Baltimore for the extension and completion of a system of docks and water front streets to meet the growing needs of the port. In addition to providing additional facilities for water transportation, the development of certain sections of the harbor front is included in the proposed plant; $10,000,000 would be required for the work contemplated. The Harbor Board is now preparing to construct one municipal dock in South Baltimore, the funds coming out of a loan authorized last year.

John D. Adt is very busy on various types of machinery, largely, however, of a special nature. Orders for elevators have also been booked, including one for the Pearl Hominy Company of this city. There has been an improvement in the demand the past month for machinery and shop supplies. Tobacco working machinery, has been in exceptionally good demand. All departments of the plant are operating full time and in some overtime is being made.

The members of the committee having in charge the preparation of plans for the contemplated industrial building for light manufacturing purposes are enthusiastic in their expressions as to the success of the plan. The first unit to be erected will occupy about 16,000 sq. ft. of ground space and represents about half the ultimate capacity of the proposed plant. The building, which is to be seven stories, of steel frame and concrete construction, will be located, if present plans are successful, at Preston street and Clifton place. P. O. Keilholtz is the engineer and Theodore W. Pietch consulting architect. The building is to be heated with steam and furnished with electric light and power and gas for industrial purposes, while live steam will be furnished tenants at a reasonable cost.

Bids are being asked by the Board of Estimate, city of Baltimore, covering extensive paving and sewer work, as well as for a considerable quantity of general supplies for various departments. The board will receive bids until April 12 for a 5-ton tandem steam road roller for the Department of Public Improvement, specifications for which are to be obtained from the city engineer. In connection with sanitary contract No. 65, bids will be received by the board for furnishing, building and installing sewage screens for the sewage disposal works, specifications against which may be had from the Sewage Commission, 904 American Building, on payment of a nominal sum. Bids will also be received April 12 for proposals for supplying ornamental lamp posts for the Department of Lamps and Lighting, specifications for which may be had from the superintendent.

Dietrich Brothers, who have been awarded the contract for the structural steel work for the new Baltimore Bargain House, state that Bethlehem shapes will figure largely in the work. Several small contracts for buildings and additions, ranging from 50 to 75 tons of structural material, have also been recently booked by the firm. Dietrich Brothers now occupy their new office building at Davis and Pleasant streets, and their new structural shop, now under erection, is about 90 per cent. completed. The necessary equipment is being installed and the plant is expected to be ready for operation in the next 30 days. A few small tools remain to be purchased to complete the equipment.

The Baltimore Bridge Company has taken a moderate volume of new business the past month, which together with the contracts already on its books keeps the plant comparatively busy. Recent orders include a small bridge for the Chesapeake & Ohio Railroad and several buildings for the Republic Finance Company for its new Portland cement plant at Union Bridge, Md., one of which is a packing house requiring about 300 tons of material. The structural work for the Holt Building, Newark, N. J., will be fabricated and erected, while orders for several small bridges for the Gautemalian Railway, in South America, have also been taken.

The T. C. Bashor Company is exceedingly busy in its boiler and tank department. It is also building a qauntity of special machinery for fertilizer work, particularly in connection with the manufacture of fish products. The heating and ventilating engineering department is busy figuring on plans for several good sized propositions. Among orders received in the past few weeks was one for 500 ft. of 96-in. diameter ½-in. thick steel pipe from a concern in Newark, N. J. Orders for a number of boilers and tanks have also been booked, while special equipment in the way of bins and supports is being made for the Republic Finance Company for installation in the new cement plant of the Tidewater Portland Cement Company, Union Bridge, Md.

The Northwest

The Milwaukee Steel Foundry Company, Milwaukee, Wis., expects to break ground within the next 10 days for the erection of a concrete and steel building, 80 x 250 ft., to be used for a foundry and office purposes. Orders for electrical equipment have been placed.

The Commercial Club of Merrill, Wis., is endeavoring to secure the establishment of a shoe factory for that city.

The Superior Water, Light & Power Company, Superior, Wis., is having plans prepared by Hazen & Whipple, New York City, for an addition to its pumping station to accomodate a new 5,000,000-gal. pump which is being built by the Epping Carpenter Company, Pittsburgh, Pa. The company also expects to build a pure water storage reservoir this summer.

The Lakeside Paper Company, recently incorporated with $125,000 capital stock, will build its plant at Menasha, Wis. Work on the construction of the plant is now going forward, but orders for only part of the necessary equipment have been placed.

Contracts have been let for the erection of a school building at Racine, Wis., to cost $50,000, and which will be known as the Gilbert Knapp School.

The Twin City Rapid Transit Company, Minneapolis, Minn., states that its plans for improvements during the current year include the construction of a combined lumber shed and store house for the use of its mechanical department, 88 x 130 ft., two stories, and a combined store house and forge shop for the use of its maintenance of way department, two stories, 30 x 60 ft., of brick and steel construction. These buildings will be located on the company's general shop grounds at Snelling and University avenues.

C. Gotzian & Co., St. Paul, Minn., shoe manufacturers, have under ocnsideration the erection of a new factory building, plans for which have not been prepared.

The City Council of Kadoka, S. D., is planning the construction of a $60,000 water works system.

Detroit

DETROIT, MICH., April 3, 1911.

The activity of the most of March was not so apparent the past week, although there was no great slump in orders and in general business; automobile manufacturers were not deluged with rush orders, as has been the case most of the month. A prominent motor car company received one especially large order from a single agent, the order amounting in round figures to $100,000. The accessory lines both in this city and throughout the State are running to full capacity, this industry having improved greatly since the first of the year.

The Gordon Pagel Bread Company of this city is undertaking the enlargement, on an important scale, of its local plant. An increase of $375,000 in its capital, followed by the placing of a $100,000 loan with a trust company of this city, paves the way for the improvements. A great deal of modern bread machinery will be purchased.

Schmied & Sismans Company's lumber mill of this city suffered a $60,000 fire loss March 26. The planing mill was completely destroyed, as well as a great quantity of lumber.

The Detroit United Railway, as a partial settlement to the street car controversy, will spend considerable money on extensions and new equipment. About 20 miles of new track will be laid and 75 new cars of the pay-as-you-enter type purchased.

This city has secured the Wetmore Adding Machine Company, at present located, in a development way, at Milwaukee, Wis. The company has been considering the qualifications of cities all the way from Buffalo to Denver, and has now decided on Detroit as the logical location. Its product is a springless adding machine.

Johnson & Waterstraut, Sturgis, Mich., manufacturers of combination coat and trouser hangers, suffered the total loss of their plant April 1. The loss is partially covered by insurance.

Douglas & Lomason, manufacturers of automobile accessories, have let the contract for the erection of a two-story concrete factory building. The firm has outgrown its present quarters and is moving to an entirely different quarter of the city.

Baldwin, Tuthill & Bolton, Grand Rapids, furniture manufacturers, have secured building permits for the construction of a three-story brick addition to their present plant. The building will cost about $10,000.

The flooring mill of Mitchell Bros., Jennings, Mich., has resumed operations after improvements, including four new flooring machines. The company's business has steadily in-

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creased and more machines will be added as business warrants it.

The Herriman Mfg. Company, Chicago, is seeking a suitable location in South Haven, Mich., for its machine shop. The principal members have been agitating the move for some time, desiring to locate in western Michigan.

The Cleveland Cliffs Iron Company is projecting water power development on the Carp River, near Marquette, that is of considerable importance. The company is adopting electricity for the operations of its mines wherever possible. A new steel and concrete dam on the Carp River, with the generating plant at Marquette, is one project. It is expected to generate about 7000 hp. The plans will involve large expenditures.

The Ottawa Leather Company, Grand Haven, has increased its capital stock from $100,000 to $200,000. It is understood that the increase is for the purpose of enlarging the plant. The action has been contemplated for some time.

The Cadillac Handle Company, Cadillac, Mich., announces that work will begin this month on the $80,000 worth of improvements now under contemplation. The improvements include a new chemical plant.

The Scoffield Carriage Company, Ovid, Mich., is in financial straits. The affairs of the company have been placed in the hands of J. H. Marshall and F. A. Robson, who will act as trustees. The company's liabilities amount to about $20,000.

The Dobbins Furnace Company, Marshall, Mich., has changed hands. The interests of the company have been transferred to W. R. Simons of Battle Creek and G. W. Leedle of the former city. The new firm intends to make considerable improvements as a first step.

The Farmers Co-operative Elevator Company and the Saginaw Milling Company both suffered a complete loss by fire of their plants March 26, at Sandusky, Mich. The latter company will rebuild immediately.

The Menominee Machinery Company, Menominee, Mich., has purchased all of the holdings of the F. G. Hood Company of Pentoge. The purchase includes the sawmill, cooperage factory and the planing mills. The property will be dismantled and moved to Menominee.

The Veitengruber Mill, Frankenmuth, Mich., was destroyed by fire last week, with a loss of $35,000. It is not known whether the company will rebuild.

The plant of the W. R. Roach Company, recently organized at Scottville, Mich., will be equipped with five engines, each of 40 hp., with six pumps in connection. The buildings and machinery will cost in the neighborhood of $155,000.

The Muskegon Steel Castings Company is a new industry for the city of Muskegon, Mich. The company has purchased a site on the lake front.

L. Kiper & Sons, Muskegon, will engage in the manufacture of leather products.

The Central Closet Mfg. Company, Holland, Mich., will move its plant to Kokomo, Ind.

The Non-Explosive Tank Company is the name of a new company incorporated with the Secretary of State. The company has a capital stock of $20,000 and will locate its plant in this city.

A new automobile accessory concern for this city is the Detroit Body Company, incorporated to manufacture automobile bodies.

The Ayres Engine & Motor Company, Trenton, Mich., has filed articles of incorporation with the Secretary of State under a new name, to be known as the Trenton Engine Company. The capital stock is given as $100,000.

With a capital stock of $50,000, the American Hydrostat Company of this city has filed articles of association. The new company will manufacture a patent hydrostat. Robert Kerby of Windsor, Ont., is president.

The Empire Cream Separator Company, Bloomfield, N. J., has filed articles of incorporation with the Secretary of State, for the purpose of establishing a branch plant at Port Huron, Mich.

Allied to the motor industry is the new Michigan Motorcycle Company, organized in this city, with a capital stock of $100,000. The company's product will be a low priced motorcycle.

The American Axe Handle Company of Tower and Grand Rapids, Mich., has been inspecting a factory site at Houghton, with a view of moving its plant at Tower to the latter city. If the move is made the company will be able to run the year round, owing to the proximity of plenty of hardwood, and will enlarge its plant accordingly.

The Kalamazoo Vegetable Parchment Company, Kalamazoo, Mich., on account of the increased demand for its product, is planning to enlarge its plant by the erection of a finishing factory. The new building will be a two-story and basement structure, 60 x 100 ft.

Work soon will be started on a large addition to the plant of the Battle Creek Paper Company, Battle Creek, Mich. The new structure will be a two-story building, 100 x 130 ft.

Flint has a new industry in the line of auto accessories. The new company will be known as the Auto Body & Specialty Company, having incorporated this week with a capital stock of $15,000.

The Michigan Carton Company, Battle Creek, Mich., has increased its capital stock from $200,000 to $400,000, for the purpose of expansion.

Marquette, Mich., is planning to bond the city for lighting plant improvements. The programme includes the rebuilding of the Silver Lake dam and the main dam near the power house. The installation of more powerful machinery will be necessary to care for the added water power. The proposed bond issue is for $100,000.

The Crystal Sand & Gravel Company was organized this week at Battle Creek, Mich., with a capital stock of $125,000. The company will erect a large cement block plant at Level Park, near the city. Willis B. Ballou is the principal stockholder.

Capitalists are completing the organization of an electric railroad to run between Pentwater and Walkerville, Mich. Pentwater has raised $20,000 as a bonus fund. Particulars are in the hands of the Pentwater Business Men's Association.

The Valley City Milling Company, Grand Rapids, Mich., is planning the erection of a five-story building, to care for the increase in business.

The Portland Mfg. Company, Portland, Mich., has broken ground for the construction of an addition to its plant, to enable the company to make its own brass castings used in the manufacture of washing machines.

The Duplex Power Car Company, Charlotte, Mich., is considering the erection of a new factory building, but is undecided whether it remain in Charlotte or seek a new location. The company manufacturers a four-wheel drive commercial truck, operated by gasoline power.

The South

LOUISVILLE, KY., April 4, 1911.

There has been a noticeable improvement in the machinery market. Orders for ice machinery, boilers and quarrying equipment have been received in larger volume, and a good deal of new work is being figured on by the manufacturers. A decision of local courts, requiring distilleries to dispose of their waste in some more sanitary way than by allowing it to run into near-by streams, is expected to result in considerable purchases of drying machinery of various kinds by many plants.

The Louisville & Nashville Railroad, which has its general offices in this city, has announced that considerable improvements are to be made in its facilities at Anniston, Ala. Besides enlarging its roundhouse, the road will install a large stationary boiler.

The Louisville Point Lumber Company is completing the installation of a considerable amount of conveying machinery made by the Jeffery Mfg. Company, Columbus, Ohio. The sale was made by Fred Wehle of Louisville.

E. T. Slider of New Albany, Ind., has purchased the plant of the Eclipse Coal Company, Louisville, and will install elevating machinery for handling coal, sand and gravel. The plant is located at Campbell and Fulton streets.

The Louisville Board of Trade has appointed a Manufacturers' Committee, which is to make an effort to induce new manufacturing enterprises to come to Louisville.

A block of $600,000 of bonds of the Kentucky Electric Company of Louisville is being sold in the Boston market. The proceeds will be used in connection with the construction of the company's new plant.

The Brinly-Hardy Company, manufacturer of plows and other farm implements, will make extensive improvements in its plant at Preston and Main streets, Louisville. It is now in the market for a considerable amount of blacksmithing machinery, as well as drop hammers, shears, &c.

The Electric Vehicle Company has been incorporated in Louisville with a capital stock of $10,000 by Lee Miles, Edward Drummond of the Drummond Mfg. Company, foundrymen; Philip Allison and H. B. Hewett of the Cooper-Hewett Company, agents for a number of electrical machinery manufacturers. The project, which is now in the experimental stage, has in view the manufacture of electric passenger and commercial automobiles. Several have been designed, and if the cars prove as practical as it is believed they will, the company will increase its capital stock to $100,000 and erect a large plant in Louisville.

The Bray Clothing Company, Louisville, has purchased the buildings of the old Kentucky Woolen Mills at Frankfort and Story avenues, and will occupy them in the next few months. The company intends greatly to enlarge its capacity, not only in connection with the special machinery

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required for clothing manufacture but also by the installation of considerable power equipment, including boilers and engines.

The C. E. Ziegler Tobacco Company, Louisville, has been incorporated with $150,000 capital stock. The business has been operated heretofore without incorporation. It is planned to erect a new plant to cost $35,000. W. D. Collins of Louisville, W. A. Bradford of Ft. Thomas, Ky., and D. C. Collins of Cincinnati are among those connected with the company.

The Southern Veneer Mfg. Company, Louisville, has increased its capital stock from $25,000 to $50,000. No new equipment will be required, as the company is now operating a plant which was rebuilt and enlarged following a fire last fall.

The University of Louisville is equipping a department of electrical engineering. Most of the equipment for the department, which will begin operations next fall, has been ordered.

Corbin, Ky., is considering the establishment of a system of water works. W. M. Steele, secretary of the Board of Trustees of the town, is now inspecting the plants of other cities.

The Empire Coal Company has been incorporated at Hopkinsville, Ky., by W. T., A. V. and N. M. Rutland, and mines at Empire have been leased for a period of 10 years. Extensive improvements will be made in the equipment of the mines. W. T. Rutland is president of the company.

The Kentucky-Panama Coal Company has been organized with $1,000,000 capital stock by Inkerman Bailey, Sr., of 66 Broadway, New York, for the purpose of developing coal land in Hopkins and Muhlenburg counties in western Kentucky. The purchase of electrically operated mining machinery, involving an expenditure of $150,000, is contemplated. Those connected with the company assert that the opening of the Panama Canal will enable Kentucky coal to be transported to that part of the hemisphere at little expense.

The Kentucky Barytes Company, Nicholasville, Ky., has filed amended articles of incorporation, increasing its capital stock from $6000 to $1,000,000.

Formal transfer of the properties of the Somerset Water, Light & Traction Company, Somerset, Ky., has been made to the United Water, Light & Traction Company, which purchased them at a sale held to wind up a receivership. Extensive improvements, including the addition of much new equipment in the power house, are to be made. O. H. Waddle is president, and J. L. Waddle manager of the new company.

The Nortonville Traction Company, Nortonville, Ky., has been chartered with $100,000 capital stock. The incorporators are Frank E. Mohr of Columbus, Ohio; Frank G. Hoge, Nortonville, and T. F. Callard, Hopkinsville, Pa.

The Eagle Casting Company, Winchester, Ky., has filed amended articles of incorporation increasing its capital stock from $30,000 to $60,000. The company has a plant for the manufacture of gas engines.

The Southern Onyx Company of Delaware is reported to have closed a deal for a large tract of onyx land in Barren County, near Glasgow, Ky., and is planning operations on a large scale.

Commissioners of the city of Memphis, Tenn., have adopted a resolution asking the State Legislature to authorize a bond issue of sufficient amount to enable a municipal lighting plant to be constructed. The amount is not definitely stated. Officials of the city have been inspecting municipal lighting plants in other towns through the North and West.

Electrical equipment is wanted by Jackson, Tenn., bids now being received for a 250-hp. engine, a generator and a switchboard. T. H. Hartmus is secretary of the Municipal Board.

N. A. Morelock of Limestone, Tenn., is asking for prices on machinery for the manufacture of cement. Crushers, grinders, burners, &c., are wanted.

The John G. Duncan Company, 308 West Jackson avenue, Knoxville, Tenn., is in the market for a 40-hp. center crank stationary engine, and a 50-hp. locomotive boiler, new or second-hand.

J. A. Wilson has taken over the control of the Sparta Water Company, Sparta, Tenn., and is planning improvements.

A bill has been introduced in the Tennessee Legislature providing for a bond issue for water works purposes by Arlington.

A bill introduced in the Tennessee Legislature authorizes Bristol to issue water works bonds.

Jonesboro, Tenn., will construct a street railway system if bonds for that purpose are authorized by the State Legislature.

The Nashville Industrial Bureau, Nashville, Tenn., is raising a fund of $200,000 for the purpose of bringing new enterprises to that city.

The improvements to be made by the Augusta Railway & Electric Company and the Augusta-Aiken Railway Company, Augusta, Ga., involve the installation of two 2500-kw. steam turbines, a 7½-mile transmission system to Clearwater, S. C., where a 500-kw. motor generator set will be installed, and the installation of a 300-kw. generator set near Aiken.

The Waddell-Williams Company, Rhoda, La., will establish a sawmill and box factory. The details of the plants have not been completed.

The Mobile Stove & Pulley Works, Mobile, Ala., will rebuild and enlarge its main foundry building, recently burned.

The International Harvester Company, Chicago, it is reported, will erect an implement plant at Bessemer, Ala., at a cost of $100,000. It is stated that a 10-acre site has also been secured.

The Franchise of the Decatur Light, Power & Fuel Company, Decatur, Ala., recently expired and has not been renewed. It is reported that the City Council is contemplating the construction of a municipal plant.

A lighting plant may be installed in the capitol building at Jackson, Miss. Address Governor Noel.

The members of the Board of Control of the State Penitentiary have returned from Angola, La., where they went to locate the new $350,000 sugar refinery, and it has been decided to locate the plant near the lake.

The success which attended the recent test at a New Orleans dock of an unloading machine or conveyor, built for the Success Pressed Steel Slat Conveyor Company, has induced the company to take steps toward establishing a factory at New Orleans to manufacture the machines for general use.

The plant of the Tremont Lumber Company at Eros, La., was destroyed by fire March 27, causing a loss of $500,000. It is expected that the mill will be rebuilt.

Q. D. Sauls, formerly of Norfield, Miss., has located at Tylertown, and will soon begin the erection of a lumber manufacturing plant.

A petition has been made to the State Legislature by the city of Pulaski, Tenn., for authority to issue $20,000 bonds for lighting purposes. It is understood that Commissioner Henry Grigsby and his associates have in view the building of a modern electric light plant, as the present plant is overloaded and somewhat out of date.

Texas

AUSTIN, TEXAS, April 1, 1911.

Reports of bountiful rains continue to come from different parts of the State, still further brightening the crop prospects. Wonderful activity is noted in all lines of industry and machinery men are in good spirits over the general situation. The prospects for the establishment of peace in Mexico are more encouraging than at any time since the revolutionary troubles in that country began, and it is expected that with the bringing about of the settlement of the disturbed conditions there will be a resumption of activity in the mines and industries generally. Tentative plans for many important municipal improvements are being held in abeyance pending the restoration of order in that republic.

The Hygeia Mineral Water Company will install a bottling works at Southerland Springs. It was recently organized with a capital stock of $30,000, the incorporators being W. E. Nelson and H. P. Nelson of San Antonio, and Judson Hume of Southerland Springs.

P. L. Downs of Temple, who is the principal owner of the old gas plant at that place, which was closed down several years, has advised the City Council that he has about concluded negotiations for the construction of a new plant and distributing system to cost $100,000.

The municipal lighting system of Llano is to be extended, and other improvements will be made to the plant.

The Business Men's Club of Waco, through President H. H. Shear and other members, is negotiating with a syndicate of men with the view of constructing an interurban electric railway between Waco and Cleburne, a distance of about 50 miles.

The Barstow Irrigation Company, Barstow, will construct a large water storage reservoir and make other improvements to its system of irrigation at a cost of several hundred thousand dollars.

The Beaumont Water Works Company, Beaumont, has under consideration the installation of improvements that will serve to eliminate the salt water that enters the distributing system from the river from which the supply is obtained during periods of drought. J. E. Gibson, a water works expert of Philadelphia, is making an investigation with that end in view.

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W. C. Hunt of Alvin and associates have been granted a franchise for the construction of water works system for that town. The distributing system will extend all through the business and residence portions of the town. The proposed improvement will cost about $25,000.

An electrically operated cotton gin will be installed at Brenham by William Seidel.

The Uvalde Electric Light Company will install a gasoline engine and will furnish a day power current for its patrons in Uvalde.

S. M. Swenson & Sons will install a large irrigation pumping plant on the Clear Fork of the Brazos River, three miles below Leuders. If this plant proves the success that is expected the firm will install several other pumping plants at points on the Brazos River to irrigate its lands.

G. A. Morris and T. S. Jackson will rebuild their ice plant at Roswell, N. M., that was recently destroyed by fire.

The Guanajuato Light & Power Company is constructing about 9 miles of transmission line west from Silao, Mexico, to Juarichos, for the purpose of installing a large electric pumping plant to irrigate lands in that section. The company is also building another line three miles long from Silao to Charcos for the same purpose. The company recently installed four pumps at the Nopales hacienda. The company's general offices are at Guanajuato, Mexico.

The capacity of the Denison Ice Company's ice plant at Denison, has been increased to 100 tons daily. It recently added two 150-hp. boilers to its plant.

An electric light and ice plant will be installed at Alto by L. S. Atkins of Center. The ice plant will have a daily capacity of 10 tons.

An electric light plant will be installed at Francis, Okla., by the City Council.

A cement brick plant will be erected at Roswell, N. M., by C. M. Allison.

A creamery will be installed at Decatur by a company that is being organized there under the auspices of the Board of Trade.

A gas lighting system will be installed at Sunset by the Lone Star Gas Company.

The installation of a new ice plant by Wilkins & Goodlow, at Mount Vernon, will soon be finished.

An electric light plant and water works system will be installed at Boswell, Okla., $35,000 of bonds having been voted recently for the purpose.

A factory for the manufacture of various articles out of hardwood timber will be erected at Longview by the Longview Hardwood Specialty Company. About $100,000 will be invested in the plant.

A water works plant and distributing system will be installed at Dawson by J. F. Williams.

The capital stock of the Tips Foundry & Machine Company, Austin, has been increased from $20,000 to $40,000 to provide for enlargements and improvements to the plant.

The Board of Trade of Hillsboro is promoting the construction of an interurban electric railway between Dallas and that place.

A large factory for the manufacture of wax from the candelilla weed that grows wild in the upper border region of Texas, is to be established at McKinney Springs, Brewster county, by Oscar Pacius of Monterey, Mexico, and associates.

The City Council of Brownsville has under consideration the application made by the Brownsville & Gulf Railway Company for a franchise to extend its line through that place and to operate motor cars over it. The existing road is to be rehabilitated and place in first class condition.

The Wisconsin Sugar Company, Milwaukee, Wis., has under consideration the establishment of a beet sugar factory at Bronwsville or some other point in the lower valley of the Rio Grande. R. G. Wagner, president of the company, recently made a personal investigation of the situation with this object in view.

The Weisenborn Mfg. Company, which is to establish a factory near Houston for the manufacture of woven wire, will soon begin the erection of its foundry and machine shop buildings.

An interurban electric railway will be constructed by the San Leon Terminal Railway Company, Houston, from San Leon to Dickinson, about eight miles.

The Puebla Light & Power Company, Puebla, Mexico, will install a large hydro-electric plant at Tuxpango, and construct electric power transmission lines to Puebla and other towns of that section. It is stated that about $6,000,000 will be invested in the enterprise. Lord Cowdray, London, Eng., is largely interested in the company.

Allen & Price, Washington, Ind., have bought a site at Gonzales, Texas, and will erect a plant for the manufacture of bridge material and road machinery. Work will begin at once.

The Rock Drill Machinery Company, El Paso, has been incorporated with a capital stock of $50,000. The incorporators are W. H. Leonard and D. B. Turner.

The Walter Box Company, Georgetown, has increased its capital stock from $10,000 to $25,000.

The Farmers' Union Gin & Warehouse Company, Olney, has been incorporated with a capital stock of $14,000. The incorporators are C. W. Junker, W. H. Rothwell and others.

Pacific Coast

PORTLAND, ORE., March 29, 1911.

Local merchants are receiving a very satisfactory volume of business in general machine shop equipment, but orders for tools of large size are the exception. Foundry business is only moderately active. The market for general machinery throughout Oregon and Washington is in very satisfactory condition, with numerous inquiries for power and water works equipment, electrical machinery, &c. The movement of mining machinery and supplies to Alaska is unusually heavy this season, and numerous orders are coming out for stamp mills, &c., for mines in that district. The movement of woodworking machinery in Oregon and Washington is about normal for this season, but the demand for logging equipment is hardly up to expectations, as operations in this district are being resumed on a smaller scale than last spring. The general opening of the logging camps is considerably later than usual.

B. F. Yates, of the Berlin Machine Works, Beloit, Wis., has been visiting the cities of the north Pacific Coast, and it is believed that the establishment of a branch factory is contemplated by this house.

Bell, Williams & Co. have purchased a site at Thirty-third and Halsey streets on which they propose to erect a machine shop.

The Washington Iron Works is erecting a concrete foundry building, to be occupied by the Puget Sound Bridge & Dredging Company, at Eighth avenue, South and Connecticut streets, Seattle, Wash.

The Washington Steel & Iron Company, recently organized at Spokane, Wash., is promoting a project for the development of an iron ore deposit near Wenatchee, Wash.

H. V. Gates & Son are planning to install a shop at Hillsboro, Ore., for the manufacture of riveted pipe and water works supplies.

The town of Medford, Ore., has ordered two rock crushers of 12 tons per hour capacity from the Beach Mfg. Company, Portland.

The city of Spokane, Wash., is in the market for a number of laundry machines.

A lively inquiry is now coming out for road machinery in preparation for improvements to be carried out this summer by many counties and towns of Oregon and Washington. Washington County, Ore., has ordered a steam roller, and the town of Dallas, Ore., is taking figures on a scraper.

The Hood River Apple Growers' Union has placed an order for refrigerating machinery with Bell & Wildman of this city.

The Jones Market, this city, is installing a 15-ton motor-driven refrigerating plant made by the Vulcan Iron Works, San Francisco. A 5-ton marine type refrigerating machine of the same make is being installed in the steamer Northland of the Northland Steamship Company, Seattle, Wash.

An order has been issued by the Oregon Labor Commissioner to compel the installation of blower sawdust collecting systems in planing mills all over the State.

The North Bend Lumber Company, North Bend, Ore., is planning to install a new band saw and log carriage.

The Husum Lumber Company, Husum, Wash., is preparing to increase the capacity of its mill by the addition of new machinery.

The Morrison Mill Company has taken an option on a site at Bellingham, Wash., where it proposes to erect a large box shook mill.

John Snyder of the Tacoma Fir Door Company has secured a large tract on the Bay Island channel, near Tacoma, Wash., on which he intends to erect a saw and planing mill and lighting plant.

The Hawley Pulp & Paper Company, Oregon City, Ore., has installed a new water wheel.

The Pacific Power & Light Company of this city has bought out the Hood River Power & Light Company and the Husum Power Company, with plants at Hood River, Ore., and White Salmon, Wash., and announces that a material increase will be made in the equipment of both plants, as well as in the transmission system.

W. D. Collins, who is operating the Venicia mine near Lewiston, Cal., is preparing to install a gasoline hoist.

The Golden Rod Milling Company has taken over the business of the Acme Mills Company of this city, and will rebuild and enlarge the flour mill which has been operated by the latter.

THE MACHINERY MARKETS

The town of Wenatchee, Wash., is considering the installation of a large pumping plant on the Columbia River.

Bids will be taken April 7 for machinery for the manual training department of the Broadway High School, Seattle, Wash.

The Twin Falls Mill & Elevator Company, Twin Falls, Idaho, announces its intention to erect a flour mill adjoining its grain elevator.

The Byron Jackson Iron Works, San Francisco, Cal., has taken a Government contract for six large centrifugal pumps for the Salt River Irrigation Project.

The Salt River Valley Water Users' Association, Phoenix, Ariz., has let a contract for two turbine water wheels to the Morgan Smith Company, York, Pa., at $16,590, and for generators and transformers to the General Electric Company at $30,000.

The Broadview Dairy Company, Spokane, Wash., is erecting a new dairy and ice cream plant in which machinery will be installed at a cost of about $15,000.

Contracts have been let for three large generators for the Rogue River Electric Company at Prospect, Ore.

The Joshua Hendy Iron Works, San Francisco, Cal., has taken over the plant of the Johnson Tractor Company's plant, with the intention of manufacturing traction engines. The machine work will be done at the large plant of the Joshua Hendy Iron Works at Sunnyvale, Cal., the Johnson shop being used as an assembling plant. F. D. Calkins will have charge of the traction engine department.

Canada

TORONTO, ONT., April, 1, 1911.

Trade has been affected by the backwardness of the weather, which at the end of March contrasted strongly with the promising condition of the weather at the beginning of the month. In one way this backwardness has been of some advantage. While it causes delay in the beginning of construction operations, and in the opening of navigation, it gives manufacturers working on orders for plant and equipment a chance to catch up. It is expected that buyers will become impatient for delivery on spring account as soon as fine weather sets in. The idea is getting into the minds of business men that political conditions may play a larger part in the state of trade than they have been doing up to the present. The possibility that a general election may be sprung on the country is not absent from the thoughts of men in commercial life. If the Opposition should endeavor to block the reciprocity agreement by obstructing in supply, as was thought probable, the Government would be forced to go to the country. There is some uncertainty in business because of the reciprocity question, but on the whole, trade is flourishing.

At the annual meeting of the Canadian Westinghouse Company, Hamilton, Ont., it was stated that the increase of business would call for extensive additions to plant.

Building operations will be begun on the works of Steel & Radiation, Ltd., at St. Catharines, Ont., as soon as the structural steel can be got on the ground. The cost of the plant is to be $100,000.

The Moncton Tramways, Electricity & Gas Company, Moncton, N. B., has taken over the municipal lighting plant of that city.

The Ontario Government loan of $5,000,000 for the extension of the Temiskaming & Northern Ontario Railway and for further hydro-electric science, will be floated in England.

The Canadian General Electric Company, Peterborough, Ont., has taken over the plant of the Canadian Shipbuilding Company, Bridgeburg, Ont.

The Kootenay Jam Company will build a factory to cost $50,000 at New Westminster, B. C. Chowdate machinery, made in Germany, will also be installed.

This summer the city of Ottawa will spend about $200,000 on sewer construction. Twice that sum is at the disposal of the Municipal Council for the purpose, but the remainder will not be used till next year.

The Canadian Pacific Railway Company, Montreal, will call for tenders for the construction of a reinforced concrete bridge, 500 ft. long, at Graham station.

Ottawa's plans for commercial building this year are the largest in the history of the city.

A charter has been issued to the Winnipeg Steel Granary & Culvert Company, Winnipeg, Man., with a capital stock of $100,000. It will manufacture corrugated steel products of all kinds.

The Winnipeg plant of the Dominion Bridge Company is now in operation.

Contracts in connection with the extension of plant at Kakebeka Falls have been awarded by the Kaministiquia Power Company, Fort William, to the John Inglis Company, Toronto, for the penstock; to J. M. Voith, for the waterwheels; to the Canadian General Electric Company, Peterborough, Ont., for the electrical equipment; to the Steel Company of Canada, for the wire. Estimated cost $200,000.

The Canadian Westinghouse Company, Hamilton, Ont., has the contract to install a municipal lighting plant at Sherbrooke, Que.

The Spanish River Pulp & Paper Company, Espanola, Ont., has awarded contracts for two 164-in. paper machines to Pusey & Jones, Wilmington, Del. The machines will have a capacity of 55 tons per day each. To the Watrous Engine Works Company, Brantford, Ont., it gave a contract for eight beaters. The Canadian Westinghouse Company, Hamilton, Ont., gets the contract for the generator, and the Robb Engineering Company, Amherst, N. S., gets the contract for the boilers.

J. M. Winters is negotiating with the municipality of Tilbury, Ont., for terms for the opening of an industry in the town to manufacture gasoline engines.

The National Manufacturing Company, Brockville, Ont., which makes cream separators, scales, stoves and ranges, is arranging for a large addition to its plant.

The American Concentration Company, Joplin, Mo., is building a $75,000 concentration plant for the Canada Iron Corporation, in connection with the latter's Tarbrook mines.

The Harbor Commissioners of Montreal have approved plans for the construction of grain elevators, railroad sidings, and other improvements at the port of Montreal, to cost $2,500,000. The work is to be done as far as possible this season.

Proposals for the construction of a large plant to manufacture asbestos products are being made to the city of London, Ont. A plant employing 300 hands is under consideration.

The Canadian Pacific Railway Company is credited with plans at Fort William that will call for an outlay there of $6,000,000 this year. The improvements will include a new coal dock, wharf, coal handling plant, a landing dock for steel, a cleaning elevator, and other works.

From the M. Rumley Company, La Porte, Ind., a shipment of 35 carloads of oil-pull tractor engines was received at Regina, Sask., this week. This is the third shipment the company has made to the Canadian West this season. Regina is its headquarters in the Canadian West.

Nearly $4,000,000 was transferred from London, Eng., some days ago to the head office of the Bank of Montreal, to meet payments in connection with the organization of the Canadian Steel Foundries, Ltd., for the taking over by that new corporation of the Montreal Steel Works, Ltd., and the Ontario Iron & Steel Company, Welland, Ont.

Three hundred gasoline plowing outfits have been booked by one implement company in Battleford, Sask., this season. The high prices of horses are given as the reason for this development.

The Acme Electrical Appliance Company, capital stock $300,000, has been incorporated under Ontario laws. The head office is to be in Brantford.

The Page-Hersey Iron, Tube & Lead Company, Welland, Ont., has awarded the contract to David Dick & Sons, Ltd., of that city, for the construction of its new plant there at a cost of $150,000. The Canadian Automatic Transportation Company, Welland, has also placed the contract with the same construction company for the erection of its plant to cost $25,000.

The Welland Machine & Foundries Company, Ltd., Welland, Ont., has been granted a charter and will build a manufacturing plant at once. The capital stock is $40,000. Among the directors are David Ross, John M. Crow and Ernest L. Garner, of Welland.

Government Purchases

WASHINGTON, D. C., April 3, 1911.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids April 25 for furnishing and erecting two traveling cranes, schedule 3458, and one radial drill, two engine lathes, one boring and drilling machine, one boring and turning mill, schedule 3459.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids April 29 for furnishing and installing in the power plant at the United States naval station, Pearl Harbor, Hawaii, six 450-hp. water tube boilers, equipped with oil burning apparatus, superheaters, flue and stack.

The Commissioners of the District of Columbia will open bids April 7 for the installation of boilers and connections complete at the Industrial Home School, Washington, and for the installation of two 100-hp. Economic boilers at the workhouse site, Occoquan, Va.

The purchasing officer of the Isthmian Canal Commission, Washington, will open bids May 27, under Canal cir-

cular 627, for furnishing miter gate moving machines, miter forcing machines and electric motors for the lock gates.

The Department of the Interior, United States Reclamation Service, Washington, will open bids April 13 for furnishing electrical apparatus and hydraulic turbines for Truckee-Carson project, Nev. Particulars can be had from the United States Reclamation Service, 605 Federal Building, Los Angeles, Cal.

The United States Engineers' office, Oswego, N. Y., will open bids April 24 for dredging machinery for dipper dredge.

The Isthmian Canal Commission, Washington, opened bids March 22, for furnishing one medium steel cutter complete, cast steel, as follows: Baldt Steel Company, New Castle, Del., $575; Detroit Steel Casting Company, Detroit, Mich., $245.25; Penn Steel Casting & Machine Company, Chester, Pa., $830; J. F. Pennell, New York, 16.5 cents per pound; Rosedale Foundry & Machine Company, Pittsburgh, Pa., 15.9 cents per pound; Union Foundry & Machine Company, $560.

Trade Publications

Valves and Fittings.—The Ohio Brass Company, Mansfield, Ohio. Catalogue H. Size, 6 x 9 in.; pages, 56. Calls attention to an extensive line of valves and steam specialties. Included in the former are radiator valves, pressure regulating valves and globe, angle and check valves. All of the lines covered are illustrated and numerous sectional views are included to show the construction.

Grinding Machines.—Landis Tool Company, Waynesboro, Pa. Catalogue. Illustrates and describes the various grinding machines built by this company. These include universal and plain grinders, self-contained plain grinders, internal grinders and a machine for grinding cranks. The special features of the Landis line are first discussed, followed by a statement of the various classes of work for which the different machines are adapted. Next in order comes the description of the different machines, including the No. 3 universal grinder, illustrated in *The Iron Age* July 21, 1910, and the 16 x 72 in. plain self-contained machine, an illustrated description of which appeared in *The Iron Age* April 21, 1910. Instructions on the care and the use of the machines are given, followed by a table of allowances for grinding and views of the different shapes of wheels furnished.

Electric Lighting.—Holophane Company, Newark, Ohio. Loose leaf catalogue sheets. Call attention to a number of new globes which have been brought out. Data on the derivation of illumination curves from printed tables and from the foot-candle curve are given, as well as information on various illumination calculations.

Mining Locomotives.—Milwaukee Locomotive Mfg. Company, Milwaukee, Wis. Bulletin No. 101. Treats of gas driven locomotives for mines, tunnels, contractors' service, lumber yards, industrial plants and railroads and brick and cement works. The various styles of locomotives are illustrated and there are a number of views showing the different parts and installations.

Punch and Shear.—Little Giant Punch & Shear Company, Sparta, Ill. Folder. Relates to the Little Giant combined punch and shear for hand operation. The machine is illustrated, and the description of the various parts is placed around the engraving with arrows showing the location of the part referred to.

Refillable Cartridge Fuse Shell.—A. F. Daum Company, Pittsburgh, Pa. Booklet No. 14. Shows several types of the Daum refillable inclosed fuse shells, gives prices and contains instructions for ordering.

Multiple Strainers.—The Lagonda Mfg. Company, Springfield, Ohio. Bulletin R. Concerned with the Lagonda-Enterprise multiple strainers for removing suspended matter from boiler feed and condenser circulating water. The special features of these strainers, which are built in sizes ranging from 2 to 48 in., are that the effective straining area is from two and a half to six times larger than that of the pipe, and that it is possible to clean separate compartments of the strainer without interrupting the flow through the others.

Polyphase Induction Motors.—Crocker-Wheeler Company, Ampere, N. J. Bulletin No. 126, superseding No. 115. Discusses the design of a line of polyphase induction constant speed motors which are built in sizes ranging from ⅛ to 250 hp. The special advantages of these motors are extreme simplicity of construction, the possibility of using them in connection with a high tension transmission system, thus reducing the cost of power and the absence of sliding contacts, which eliminates sparking and enables them to be used in textile mills, wood-working plants and other places where a small spark might cause an explosion or conflagration. Illustrations show the details of the construction of the motors, as well as a number of interesting applications of them.

Engines.—Murray Iron Works Company, Burlington, Iowa. Catalogue No. 65. Size, 3¼ x 5½ in.; pages, 84. Contains illustrations and descriptive matter concerning the Corliss engines built by this company and their various parts. Space is also given to other products, such as air compressors, pumping engines; tubular, water tube and internal furnace boilers and feed water heaters. An illustrated description of a cross compound Corliss engine built by this company for the mechanical laboratory at the University of Nebraska appeared in *The Iron Age* December 23, 1909.

Arc Lamps.—Radio Reflector Company, 352 West Thirteenth street, New York City. Folder. Calls attention to the Radio high efficiency electric arc lamp which is especially designed for lighting industrial plants. The special features of the lamp are a large amount of light on a small current consumption and long life.

Pneumatic Tools.—Independent Pneumatic Tool Company, Thor Building, Chicago, Ill. Circular N. Describes the Thor air tools and appliances, contains tables of capacities and shows several in use. The various tools illustrated include piston air drills, a reversible wood boring machine, breast and screw feed drills, pneumatic hammers for chipping, caulking and riveting; yoke riveters, a grinding machine and a close-quarter drill which was illustrated in *The Iron Age* May 28, 1908.

Motor Drive for Metal Working Machinery.—General Electric Company, Schenectady, N. Y. Bulletin No. 4815, superseding No. 4548. Shows a few of the numerous methods of applying either alternating or direct current motor drive to metal working machinery. The special features of this drive include increased production, economical power consumption, easy control and a logical arrangement of the tools. The illustrations show the various types of motors used together with the controllers and rheostats employed and a number of motor-driven tools. The last includes drills, cold saws, shapers, millers, lathes, grinding machines, boring mills, planers and punches and shears.

Grinders.—Gardner Machine Company, Beloit, Wis. Catalogue. Size, 6 x 9 in.; pages, 127. Gives general description and specifications for a complete line of disk grinders and accessories. Among the tools shown is the company's patternmakers' grinder, which was illustrated in *The Iron Age* April 28, 1910.

Rolled Steel Windows.—United States Metal Products Company, Metropolitan Building, New York City. Catalogue No. 101. Devoted to Rapp rolled steel window for all types of industrial buildings. These windows are made in two standard sizes for lights of glass measuring 10 x 16 and 12 x 18 in., respectively. The window frames are made of cold rolled steel and the glazing bars are joined together by interlocking. The joints and the intersections are welded, which adds greatly to the strength of the sash and the frames. In addition to these standard units several special types are shown. There are a number of diagrams giving the dimensions for various combinations of the two standard units.

Electric Signs.—Electric Motor & Equipment Company, Newark, N. J. Bulletin No. 127, superseding No. 112. Gives general description and specifications for an electric monogram sign which can be used for transmitting signals where letters or characters have to be flashed. These letters are flashed out distinctly and remain in sight until the message is received, thus lessening the possibility of a mistake.

Pumps and Hydraulic Machinery.—The Goulds Mfg. Company, Seneca Falls, N. Y. Catalogue F. Size, 7 x 8 in.; pages, 326. Calls attention to the various styles of pumps and hydraulic machinery for all purposes which this company is prepared to furnish. These include suction pumps, antifreezing lift and force pumps, deep well force pump standards, pumps for pneumatic water systems, house force pumps, hydraulic rams, suction pumps, double acting pumps, single acting triplex pumps and rotary force pumps. Space is given to accessories and fittings and a number of useful tables giving the friction of water in pipes, the barometric pressure at different altitudes and the capacities of various sizes of pumps are included. *The Iron Age*, October 6, 1910, contained a description of the Pyramid double action piston pump.

Valves and Gauges.—Crosby Steam Gauge & Valve Company, Boston, Mass. Circular. Refers to the safety valves and pressure gauges made by this firm and shows typical examples of each.

Horizontal Boring, Drilling and Milling Machine.—Lucas Machine Tool Company East Ninety-ninth street and L. S. & M. S. Railway, Cleveland, Ohio. Circular F-5. Illustrates and describes the new No. 32 Precision horizontal boring, drilling and milling machine. The principal feature of this machine is that it has constant speed quick power movements for all parts having feeds, and no matter what one is being employed, the quick return is obtained by manipulating the feed and quick return lever in conjunction with the feed distributing interlocking levers. These levers prevent the power movement from being operated when any feed is engaged, or vice versa, and the throwing of the feed and quick return lever to the left gives a quick vertical movement to the head, a quick cross movement to the platen or a quick longitudinal movement to the saddle or to the spindle, depending upon the position of the interlocking levers. When the quick return lever is in the right hand position the corresponding feeds are engaged.

CURRENT METAL PRICES.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1¾ in. round and square	₩ lb 1.75¢
1½ to 4 in. x ⅜ to 1 in.	₩ lb 1.85¢
1½ to 4 in. x ¼ to 5-1	
Rods—⅜ and 11-16 round and square	₩ lb 1.85¢

Angles:	Cts ₩ lb
3 in. x ¼ in. and larger	2.00¢
3 in. x 3-16 in. and ⅛ in.	2.25¢
1½ to 2½ in. x ⅛ in.	2.10¢
1½ to 2½ in. x 3-16 in. and thicker	2.00¢
1 to 1¾ in. x 3-16 in.	2.10¢
1 to 1¾ x ⅛ in.	2.20¢
⅞ x ⅛ in.	2.30¢
¾ x ⅛ in.	2.40¢
⅝ x ⅛ in.	3.45¢
½ x 3-32 in.	4.25¢

Tees:	
1 in.	2.65¢
1¼ in.	2.45¢
1½ to 2½ x ¼ in.	2.15¢
1½ to 2½ x 3-16 in.	2.35¢
3 in. and larger	2.05¢
Beams	2.00¢
Channels, 3 in. and larger	2.00¢
Bands—1½ to 6 x 3-16 to No. 8	2.30¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.60¢

Merchant Steel from Store—

	per lb
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black	One Pass, C.R Soft Steel.	R. G. Cleaned.
No. 16	₩ lb 2.55¢	2.80¢
Nos. 18 to 20	₩ lb 2.70¢	2.90¢
Nos. 22 and 24	₩ lb 2.75¢	3.00¢
No. 26	₩ lb 2.80¢	3.10¢
No. 28	₩ lb 2.95¢	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment, ₩ lb 12 @14½

Patent Planished, W. Dewees Wood, ₩ lb A, 19¢; B, 9¢ net.

Galvanized.

Nos. 12 and 14	₩ lb 2.95¢
Nos. 22 to 24	₩ lb 3.30¢
No. 26	₩ lb 3.50¢
No. 28	₩ lb 3.80¢

No. 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₩ lb 5.25¢
No. 26	₩ lb 6.25¢
No. 28	₩ lb 7.25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24 ₩ 100 sq. ft.	$3.85	4.90
No. 26 ₩ 100 sq. ft.	2.95	4.00
No. 28 ₩ 100 sq. ft.	2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:	
IC, 14 x 20	$6.65
IX, 14 x 20	7.90
A. Charcoal:	
IC, 14 x 20	$5.60
IX, 14 x 20	5.70

American Coke Plates—Bessemer—

IC, 14 x 20, 107 lb	$4.50
IX, 14 x 20	5 50

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.70
IX, 20 x 28 with an 8 lb. coating	10.70

Seamless Brass Tubes—

List November 15, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 21¢

Brazed Brass Tubes—

List February 1, 1911. 19½¢ ₩ lb

High Brass Rods—

List February 1, 1911. 14¼¢ ₩ lb

Roll and Sheet Brass—

List February 1, 1911. 14¼¢ ₩ lb

Brass Wire—

List February 1, 1911. 14¼¢ ₩ lb

Copper Wire—

Base Price. Carload lots mill 13¾¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz (quantity lots) ₩ lb 18 ¢

Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled.

Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot

Sheet Copper Polished over 20 in. wide, 2¢ ₩ square foot.

Planished Copper, 1¢ ₩ square foot more than Polished.

METALS—

Tin—

Straits Pig ₩ lb 45 @44 ¢

Copper—

Lake Ingot	₩ lb 14½@15 ¢
Electrolytic	₩ lb 14¾@14¢
Casting	₩ lb 14¼@14¢

Spelter—

Western ₩ lb 6¼@6¾¢

Zinc.

No 9, base, casks ₩ lb 8 ¢ | Open ₩ lb 8¢

Lead.

American Pig	₩ lb 5 @5¼¢
Bar	₩ lb 6¼@6¾¢

Solder.

½ & ½, guaranteed	₩ lb 23 @23½¢
No. 1	₩ lb 26 @26½¢
Refined	₩ lb 25½@24 ¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ lb @10¢
Hallette	@10¢
Other Brands	@9½¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting 32¢

Rods & Wire Base Price 31¢

Sheets Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₩ lb 10.75@11.00
Copper, Heavy and Wire	₩ lb 10.50@10.75
Copper, Light and Bottoms	₩ lb 9.50@9.75
Brass, Heavy	₩ lb 7.00@7.25
Brass, Light	₩ lb 5.50@5.75
Heavy Mechine Composition	₩ lb 9.25@9.50
Clean Brass Turnings	₩ lb 7.00@7.25
Composition Turnings	₩ lb 8.25@8.50
Lead, Heavy	₩ lb @3.75
Lead, Tea	₩ lb @3.50
Zinc Scrap	₩ lb @4.00

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